

**For Reference**

---

**NOT TO BE TAKEN FROM THIS ROOM**

# For Reference

---

NOT TO BE TAKEN FROM THIS ROOM

Ex libris  
UNIVERSITATIS  
ALBERTAENSIS





Digitized by the Internet Archive  
in 2020 with funding from  
University of Alberta Libraries

<https://archive.org/details/Plaxton1969>





THE UNIVERSITY OF ALBERTA

THE RELATIONSHIPS OF DECISION-RULE TO INTERACTION  
PATTERNS, SATISFACTION, AND COMMITMENT IN  
SMALL GROUPS

by



ROBERT PIERCY PLAXTON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES  
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE  
OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF EDUCATIONAL ADMINISTRATION

EDMONTON, ALBERTA

FALL, 1969



UNIVERSITY OF ALBERTA  
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "The Relationships of Decision-rule to Interaction Patterns, Satisfaction, and Commitment in Small Groups," submitted by Robert Piercy Plaxton in partial fulfilment of the requirements for the degree of Doctor of Philosophy



## ABSTRACT

The purpose of the study was to determine relationships between the decision-rules under which decision-making groups operate, and (a) the interaction patterns within the groups, (b) the time required to reach a decision, (c) the satisfaction of group members with the process by which the decision was made, and (d) the commitment of members to the decisions reached.

The study was structured around a repeated measures design with three treatments (decision-rules) being applied to each of six groups. Each group met once under each of the decision-rules (centralist, majority, and consensus) to reach a decision concerning one of three different educational problems. The discussion sessions were recorded on videotape.

The sample consisted of 30 students chosen at random from the class lists of a graduate course in educational administration. The subjects were assigned at random to six five-man groups. The person assigned last to each group was designated to act as chairman.

Interaction data were collected by coding all verbal communications according to both content and source and direction. Thirty categories derived from those suggested by Bales were utilized. Other data were collected by timing the discussion sessions, and by administering instruments developed to measure satisfaction with process and commitment to decision.

Analysis of the interaction data indicated a number of relationships between decision-rules and patterns of interaction.





In the most general terms, a tendency existed for group members under the consensus arrangement to request and to exchange more ideas and information and to be more supportive than under the centralist arrangement.

The data concerning the duration of discussion sessions indicated a tendency for the length of sessions to increase as the decision-rule changed from centralist to majority to consensus.

Data from the process and decision instruments indicated that non-leader members were significantly more satisfied with the process and committed to the decision under both the majority and consensus arrangements than under the centralist arrangement.

The conclusion was drawn that, despite the limitations of the study, the indications of relationships between decision-rules and both interaction patterns and outcomes were consistent enough, and their implications important enough, to warrant replications of the study.



## ACKNOWLEDGEMENTS

The assistance and cooperation of a number of individuals and organizations have made this study possible. First, the writer wishes to express his appreciation to the supervisor of this thesis, Dr. C. S. Bumbarger, whose counsel, guidance, and encouragement were invaluable. Thanks are extended also to Dr. D. A. MacKay, Dr. E. Holdaway, and Mr. W. A. Meloff, other committee members who gave unselfishly of their time.

Second, the financial support of the University of Alberta, the Province of Alberta, and the Alberta Teachers' Association is gratefully acknowledged.

Third, appreciation is extended to the graduate students who took time from a heavy schedule to act as subjects for the study.

Finally, thanks are extended to the staff of the Audio-Visual Media Center of the Faculty of Education, who provided their facilities, their time, and their knowledge in connection with the videotaping of the discussion sessions.



## TABLE OF CONTENTS

CHAPTER		PAGE
I.	INTRODUCTION TO THE PROBLEM . . . . .	1
	Background to the Problem . . . . .	1
	The Problem . . . . .	8
	General Statement of the Problem. . . . .	8
	The Independent Variable. . . . .	8
	The Dependent Variables . . . . .	9
	Sub-problems Associated with Interaction Patterns. . . . .	10
	Sub-problems Associated with Outcomes of the Process . . . . .	13
	Significance of the Problem . . . . .	15
	Delimitations . . . . .	16
	Limitations . . . . .	17
	Definitions of Terms. . . . .	18
	Chapter Summary . . . . .	20
II.	CONCEPTUAL FRAMEWORK. . . . .	21
	Theoretical Considerations. . . . .	21
	Decision-rules and Authority. . . . .	25
	Decision-rules and Interaction Patterns . . .	27
	Source and Direction of Communications. . .	27
	Content of Communications . . . . .	31
	Decision-rules and Decision-time. . . . .	32
	Decision-rules and Satisfaction with Process.	34





CHAPTER	PAGE
Decision-rules and Commitment to Decision. .	37
Chapter Summary. . . . .	40
III. RESEARCH DESIGN AND PROCEDURES . . . . .	42
General Considerations . . . . .	42
Design . . . . .	42
Description of the Sample. . . . .	45
Description of the Discussion Problems . .	45
Procedures for Discussion Sessions . . . .	45
Pilot Project. . . . .	48
Videotaping Procedures . . . . .	49
Interaction Recording. . . . .	50
Interaction Categories . . . . .	50
Coder Training . . . . .	56
Coding Interaction . . . . .	56
Reliability of coding. . . . .	57
Instrumentation. . . . .	58
The Decision Instrument. . . . .	59
The Process Instrument . . . . .	59
Hypotheses . . . . .	63
Hypotheses Associated with Process . . . .	64
Hypotheses Associated with Outcomes. . . .	68
Data Analysis. . . . .	69
Chapter Summary. . . . .	70



CHAPTER	PAGE
IV. DATA ANALYSIS AND RESULTS - INTERACTION	
PATTERNS . . . . .	71
Total Interaction. . . . .	72
Hypothesis I.1 . . . . .	73
Hypothesis I.2 . . . . .	75
Hypothesis I.3 . . . . .	76
Source and Direction of Communications	
Hypotheses I.4, I.5, I.6, I.7, I.8 . . . . .	78
Content. . . . .	80
Hypotheses I.9, I.10, I.11, I.12, I.13, I.14 . . . . .	80
Content and Attribution Combined . . . . .	83
Hypothesis I.15. . . . .	83
Hypothesis I.16. . . . .	85
Hypothesis I.17. . . . .	86
Hypothesis I.18. . . . .	87
Hypothesis I.19. . . . .	89
Additional Analyses. . . . .	91
Wilcoxon Tests . . . . .	91
Percentage of Total Interaction under each Treatment. . . . .	94
Chapter Summary. . . . .	100
Significant Differences. . . . .	100
Trends . . . . .	101



CHAPTER	PAGE
V.	DATA ANALYSIS AND RESULTS - OUTCOMES. . . . .
	104
	Decision-time . . . . .
	105
	Satisfaction with Process . . . . .
	106
	Hypothesis III.1. . . . .
	107
	Hypothesis III.2. . . . .
	109
	Hypothesis III.3. . . . .
	110
	Sub-hypothesis III.1(a) . . . . .
	112
	Sub-hypothesis III.1(b) . . . . .
	113
	Sub-hypothesis III.1(c) . . . . .
	115
	Sub-hypothesis III.2(a) . . . . .
	116
	Sub-hypothesis III.2(b) . . . . .
	117
	Sub-hypothesis III.2(c) . . . . .
	118
	Sub-hypothesis III.3(a) . . . . .
	119
	Sub-hypothesis III.3(b) . . . . .
	120
	Sub-hypothesis III.3(c) . . . . .
	122
	Commitment to Decision. . . . .
	123
	Hypothesis IV.1 . . . . .
	124
	Hypothesis IV.2 . . . . .
	125
	Hypothesis IV.3 . . . . .
	126
	Chapter Summary . . . . .
	128
VI.	SUMMARY, CONCLUSIONS, AND IMPLICATIONS. . . . .
	131
	Summary . . . . .
	131
	The Research Project. . . . .
	131
	Findings. . . . .
	135





CHAPTER		PAGE
	Conclusions . . . . .	141
	Limitations . . . . .	141
	Decision-rules and Interaction. . . . .	142
	Decision-rules and Satisfaction with	
	Process . . . . .	146
	Implications. . . . .	149
	Implications for Further Research . . . .	149
	Implications for Educational Administration	151
BIBLIOGRAPHY . . . . .		152
APPENDIX A.	Procedural Rules. . . . .	158
APPENDIX B.	Original Instruments. . . . .	164
APPENDIX C.	Final Instrument Items. . . . .	171
APPENDIX D.	Discussion Problems . . . . .	175



# LIST OF TABLES

TABLE		PAGE
I.	Arrangement of Problems and Sessions by Decision-rule. . . . .	43
II.	Categories for Interaction Process Analysis. .	51
III.	Comparison of Interaction Categories for the Present Study with Those of Bales. . . .	53
IV.	Varimax Solution for the Decision Instrument .	60
V.	Varimax Solution for Process Instrument - Three Factors. . . . .	62
VI.	Interaction Categories under Three Decision- rules - Means, Sums of Ranks, and Friedman Statistic Probabilities. . . . .	74
VII.	Means, Sums of Ranks, and Friedman Statistic Probability for Total Communication from Leader under Three Decision-rules. . . . .	75
VIII.	Means, Sums of Ranks, and Friedman Statistic Probability for Total Communication from Individuals under Three Decision-rules . . .	76
IX.	Wilcoxon Matched-pairs Signed-ranks Tests for Samples under Three Treatments . . . . .	93
X.	Total Communication by Groups under Three Treatments . . . . .	95
XI.	Means, Sums of Ranks, and Friedman Statistic Probability for Per Cent of Total Interaction Individual to Group Under Three Decision-rules	96



TABLE		PAGE
XII.	Means, Sums of Ranks, and Friedman Statistic Probability for Per Cent of Total Interaction Individual to Group Gives Advice under Three Decision-rules. . . . .	97
XIII.	Means, Sums of Ranks, and Friedman Statistic Probability for Per Cent of Total Interaction Leader to Individual Asks Information under three Decision-rules. . . . .	99
XIV.	Means, Sums of Ranks, and Friedman Statistic Probability for Decision-time in Minutes under Three Decision-rules. . . . .	106
XV.	Means, Sums of Ranks, and Friedman Statistic Probability for Group Members' Satisfaction with Process under Three Decision-rules . . . . .	108
XVI.	Means, Sums of Ranks, and Friedman Statistic Probability for Leaders' Satisfaction with Process under Three Decision-rules. . . . .	109
XVII.	Means, Sums of Ranks, and Friedman Statistic Probability for Individuals' Satisfaction with Process under Three Decision-rules. . . . .	110
XVIII.	Means, Sums of Ranks, and Friedman Statistic Probability for Group Members' Scores on the Performance Facilitation Sub-scale under Three Decision-rules. . . . .	112





TABLE		PAGE
XIX.	Means, Sums of Ranks, and Friedman Statistic Probability for Group members' Scores on the Task Achievement Sub-scale under Three Decision-rules . . . . .	114
XX.	Means, Sums of Ranks, and Friedman Statistic Probability for Group Members' Scores on the Discussion Adequacy Sub-scale under Three Decision-rules . . . . .	115
XXI.	Means, Sums of Ranks, and Friedman Statistic Probability for Leaders' Scores on the Performance Facilitation Sub-scale under Three Decision-rules . . . . .	116
XXII.	Means, Sums of Ranks, and Friedman Statistic Probability for Leaders' Scores on the Task Achievement Sub-scale under three Decision- rules. . . . .	117
XXIII.	Means, Sums of Ranks, and Friedman Statistic Probability for Leaders' Scores on the Discussion Adequacy Sub-scale under Three Decision-rules . . . . .	118
XXIV.	Means, Sums of Ranks, and Friedman Statistic Probability for Individuals' Scores on the Performance Facilitation Sub-scale under Three Decision-rules . . . . .	120



TABLE		PAGE
XXV.	Means, Sums of Ranks, and Friedman Statistic Probability for Individuals' Scores on the Task Achievement Sub-scale under Three Decision-rules . . . . .	121
XXVI.	Means, Sums of Ranks, and Friedman Statistic Probability for Individuals' Scores on the Discussion Adequacy Sub-scale under Three Decision-rules . . . . .	122
XXVII.	Means, Sums of Ranks, and Friedman Statistic Probability for Members' Commitment to Decision under Three Decision-rules. . . . .	124
XXVIII.	Means, Sums of Ranks, and Friedman Statistic Probability for Leaders' Commitment to Decision under Three Decision-rules. . . . .	126
XXIX.	Means, Sums of Ranks, and Friedman Statistic Probability for Individuals' Commitment to Decision under Three Decision-rules. . . . .	127



## LIST OF FIGURES

FIGURE		PAGE
I.	Interaction Coding Form . . . . .	55



## CHAPTER I

### INTRODUCTION TO THE PROBLEM

The purposes of this chapter are to introduce the problem, to state the problem and the specific sub-problems that arise from it, to indicate the delimitations and limitations of the study, and to define some terms used in the report.

#### Background to the Problem

Recent writings by organizational analysts contain a recurring suggestion that in the organization of the future there will be a shift of focus away from decision-making by individuals operating within bureaucratic structures, to cooperative decision-making by groups and committees (Argyris, 1967; Katz and Kahn, 1966; Likert, 1961; Litterer, 1965). Bennis (1967) expressed this point of view when he stated:

The shift would probably be from the individual level to co-operative group effort, from delegated to shared responsibility, from centralized to decentralized authority, from obedience to confidence, from antagonistic arbitration to problem-solving [p. 568].

It is important, therefore, that research into factors that affect the operation of decision-making groups be continued and expanded in order that the conditions under which such groups operate most effectively may be determined.

Much of the impetus for the study of decision-making groups derives from the importance of these groups to the organizations in





which they operate. However, few experimental studies involving small problem-solving groups have studied the effects of independent variables that can be manipulated within the groups' organizational environment.

One concept that has received considerable attention in organizational theory, but which has been all but ignored in the studies of decision-making in small groups, is that of authority. (The word "authority" is used here to mean the potential for influence vested in a particular person or position.) In organizational settings the leader of a decision-making group is almost always a man with authority. Yet the effects of authority and other forms of power have received little attention from small-group researchers.

This omission has not gone unnoticed. Cartwright (1959a) referred to power as the neglected variable and stated:

Both early social psychology and modern society recognize the importance of power. If, however, we examine social psychology since the beginning of its scientific epoch, we search in vain for any concentrated attack on the problem. Surely this constitutes a weakness of modern social psychology [p. 2].

And Golembiewski (1962) has pointed out the importance of this neglected variable to the study of small groups:

For the problem of power is also central to the study of small groups. Co-ordination implies a control system to channel behavior, and the small group is a system of co-ordinated behavior. Thus an "influence structure" is the *sine qua non* of natural-state groups. As with communication, such a system of relatively clear influence relations often will develop in the experimental small group. And it seems safe to say that effective group performance implies a power structure.

Work on the properties of influence systems, however, is a composite of paucity as well as promise [p. 97].



A recent study in the educational field (Bridges, Doyle, & Mahan, 1968) has examined directly the effects on problem-solving groups of status differences prescribed by the formal organization. Twenty groups of teachers in the United States were studied as they attempted to find the solution to what was essentially a problem in logical analysis. Ten of the groups operated with the school principal present, and were designated as hierarchically differentiated groups. The remaining ten groups consisted only of teachers and were designated as hierarchically undifferentiated groups. All groups were restricted to the use of the parliamentary constitutional arrangement in deciding whether a solution generated by the group should be presented to the experimenter as a possible solution. That is to say, a decision was binding on the group whenever a majority agreed to present a solution to the experimenter. The results indicated that the hierarchically undifferentiated groups were more productive and efficient, and showed a significantly greater amount of risk-taking behavior than did the hierarchically differentiated groups.

To provide an explanation for the differences in outcomes the researchers examined their data with reference to propositions suggested by Blau and Scott (1962). These propositions refer to certain processes assumed to be related to outcomes of group deliberations. Analysis of the data indicated a lower idea initiation rate for the hierarchically differentiated groups, but provided no evidence that the presence of formally based status differences among group members distorted the error-correction mechanism or the



distribution of social support. In more general terms, the study described above (Bridges *et al.*, 1968) examined the effects of organizationally designated status on certain outcomes of group problem solving, and attempted to explain these effects in terms of group processes. The study reported here followed the same general pattern.

McGrath and Altman (1966) have pointed out the need for studies of the type that examine both processes and outcomes:

We need a better understanding of the sequential linkages that begin with inputs in the form of member, group, and task characteristics, that become *manifested in* intermediate interactive processes, and that culminate in a performance output. Too little attention has been given to systematically establishing the links in this complex chain. What has been done is to explore initial inputs and final outputs, with insufficient attention to the ways in which input characteristics enhance or hamper final output via intermediate processes [p. 65].

Mills (1967) makes much the same point while discussing advances made in the study of small groups:

A second advance is the shift of emphasis from the study of the group's effect on either its members or its environment to the analysis of the group itself, from its influence to its process, from its output to its internal dynamics. Operationally, this has meant a shift from depending exclusively upon measures taken *before* and *after* group operation, to recording and analyzing processes *during* the group's operation [p. 8].

Bridges' study raised a number of questions that pointed the way to the design of the study reported here. One question was whether the effects noted in the Bridges' study would have arisen regardless of the source of the principals' power. French and Raven (1959) have suggested five bases of power, which are described in Chapter II of this report. All five of these bases of power may have resided with





the principals used in the Bridges' study, and thus contributed to the principals' ability to influence the behavior of group members and the outcomes of the group deliberations. School principals, for example, are often men with longer experience and more training than the average teacher. This "expert" power, therefore, may have had as much effect on the outcome as the principals' "legitimate" power. The present study was designed to control all but "legitimate" power (authority).

A second question arose concerning the effect on group processes of the type of problem the groups were asked to solve. The problem used in Bridges' study, while it had the advantage of providing relatively simple measures of productivity, efficiency, and risk-taking, had the disadvantage of being the kind of problem with which a school staff would not ordinarily be faced. In the present study the groups were faced with problems closely associated with school activities, in the hope that the members might identify more closely with the situations described and be able to apply their past working experiences in the search for solutions.

A third question, closely related to the second, was whether other types of outcomes should be evaluated. Maier (1964, p. 4) has suggested two different dimensions that are relevant in appraising a decision's potential effectiveness. One is the objective quality of the decision; the other has to do with its acceptance, or the way the persons who must execute the decision feel about it. In an experimental situation the objective quality of a





decision can only be measured effectively when the problem presented to the group has a standard solution against which solutions produced by the groups can be evaluated. Bridges' study used this kind of problem. On the other hand, since the standard solution can usually be accepted by all as self-evidently correct once it is presented, the degree of acceptance of the solution is not in question. In real situations the objective quality of a decision can usually be judged only in the light of subsequent events. For this reason the acceptance of a decision by those who must execute it may be a more useful and meaningful measure. Acceptance is best measured when the problem presented to a group has a number of possible solutions, and no standard is available by which all members can judge one alternative to be more worthy than another. In the present study the problems used were case studies developed around school problems. No attempt was made to assess the quality of the decisions reached. Rather, two other outcomes, commitment to the decision and satisfaction with the process by which the decision was reached, were evaluated.

A fourth question was whether the results of studies that involved the total absence of authority figures from decision-making groups had any direct application to larger organizations. With present organizations, at least, persons with prescribed status are almost always members of decision-making groups in order that other organizational functions such as coordination and information transmission might be carried out effectively. The present study attempted to add to Bridges' findings by using a design that would



permit a person with prescribed status to be present in all groups, but at the same time would permit the potential influence of that person on the final decision to be altered.

A final question concerned the particular aspects of group interaction under study. Bridges examined only those aspects of interaction that related directly to certain propositions put forward by Blau and Scott (1962, pp. 121-124). A study was made of the number of ideas presented to the groups and the reactions of others to these ideas. An attempt was made in the present study to examine total interaction patterns using categories to classify all verbal statements as to type, source, and direction.

In summary, authority, a concept that has received considerable recognition in organizational theory, has until recently received little attention in studies of small decision-making groups. However, a recent study (Bridges *et al.*, 1968) has examined the effects of the presence in problem-solving groups of an individual with formally prescribed status. The study demonstrated differences in both processes and outcomes between hierarchically differentiated and hierarchically undifferentiated groups. The general pattern suggested by Bridges' study was followed in the study reported here in that the effects of authority on both group processes and outcomes were examined, but this study was designed with quite different emphases. It examined the effects of varying legitimate power only, used as problems for discussion case studies based on real situations, focused upon satisfaction with the process and commitment to the



decisions as outcomes, and considered total interaction patterns.

## The Problem

### *General Statement of the Problem*

The general problem was to determine relationships that exist between the legitimate power of the leaders under whom a problem-solving group operates and (a) specific variables associated with the interaction patterns within the group, and (b) certain outcomes of the process.

### *The Independent Variable*

The study attempted to manipulate the authority of the leader as an independent variable, using the decision-rule under which the group operated as the means of manipulation. Of the five bases of power suggested by French and Raven (1959) only legitimate power was manipulated. Because the chairmen were chosen at random from the members of newly formed groups, because they were given no power to mediate rewards or punishments, and because they were no more expert or knowledgeable than other group members, their only sources of power were the rights assigned to them by the experimenter to act as chairman, to vote, and, under one decision-rule, to make the decision for the group.

Three types of decision-rule were employed in the study. These types were defined in terms of the proportion of members that was to be in agreement before a decision could be made and in terms of the amount





of authority granted the members by the decision-rule. The definitions presented below are based on those suggested by Swanson (1959), in some cases under different titles.

*The centralist arrangement.* This arrangement requires that the decision be made by the designated leader. The group is bound by the leader's decision whenever it is made. Suggestions as to the correct course of action to be taken can be made by the other members of the group, but since the leader can ignore such suggestions he has almost complete power of decision.

*The majority arrangement.* This arrangement requires that at least one-half of the group members be in agreement before the decision becomes binding. The leader has one vote, as does every other member of the group.

*The consensus arrangement.* This arrangement requires that unanimity be achieved before the decision becomes binding. Under this arrangement all members have equal voting power. Because unanimity is necessary, each member has a veto.

### *The Dependent Variables*

The study examined possible relationships between the type of decision-rule under which the group operated and a number of variables. The dependent variables were the source and direction of communication acts, the content of communications, the time





required to reach a decision, satisfaction with the decision-making process, and commitment to the decision reached.

### *Sub-problems Associated with Interaction Patterns*

In order that the problem might be defined more clearly it was divided into a number of sub-problems. This section lists the sub-problems that were examined in connection with interaction patterns.

Each verbal communication was placed in one of 30 categories. These categories were formed by first dividing the total interaction into six content categories ("positive reaction," "gives advice," "gives information," "asks information," "asks advice," and "negative reaction"), and then dividing each of these categories into five source-and-direction categories ("leader to group," "leader to individual," "individual to group," "individual to leader," and "individual to individual"). For purposes of analysis some of the categories were examined in combination before being examined separately. The word "individual" as used in this section refers to non-leader members of the group.

*Sub-problem I.1.* What relationship exists between the decision-rule employed and the total number of communications initiated by group members?



*Sub-problem I.2.* What relationship exists between the decision-rule employed and the total number of communications initiated by the leader?

*Sub-problem I.3.* What relationship exists between the decision-rule employed and the total number of communications initiated by individuals?

*Sub-problem I.4.* What relationship exists between the decision-rule employed and the total number of communications from the leader to the group?

*Sub-problem I.5.* What relationship exists between the decision-rule employed and the total number of communications from the leader to an individual?

*Sub-problem I.6.* What relationship exists between the decision-rule employed and the total number of communications from individuals to the group?

*Sub-problem I.7.* What relationship exists between the decision-rule employed and the total number of communications from individuals to the leader?

*Sub-problem I.8.* What relationship exists between the decision-rule employed and the total number of communications from individuals to other individuals?



*Sub-problem I.9.* What relationship exists between the decision-rule employed and the total activity in the "positive reaction" category?

*Sub-problem I.10.* What relationship exists between the decision-rule employed and the total activity in the "gives advice" category?

*Sub-problem I.11.* What relationship exists between the decision-rule employed and the total activity in the "gives information" category?

*Sub-problem I.12.* What relationship exists between the decision-rule employed and the total activity in the "asks information" category?

*Sub-problem I.13.* What relationship exists between the decision-rule employed and the total activity in the "asks advice" category?

*Sub-problem I.14.* What relationship exists between the decision-rule employed and the total activity in the "negative reaction" category?

*Sub-problem I.15.* What relationship exists between the decision-rule employed and the number of communications from the leader to the group within each of the six content categories?



*Sub-problem I.16.* What relationship exists between the decision-rule employed and the number of communications from the leader to an individual within each of the six content categories?

*Sub-problem I.17.* What relationship exists between the decision-rule employed and the number of communications from individuals to the group within each of the six content categories?

*Sub-problem I.18.* What relationship exists between the decision-rule employed and the number of communications from individuals to the leader within each of the six content categories?

*Sub-problem I.19.* What relationship exists between the decision-rule employed and the number of communications from individuals to other individuals within each of the six content categories?

Each of the last five sub-problems listed above was, in fact, six sub-problems. Consequently, this section contains 44 sub-problems associated with interaction patterns.

#### *Sub-problems Associated with Outcomes of the Process*

This section lists the sub-problems tested in connection with certain outcomes associated with the group discussions. The sub-problems ask what relationships exist between the decision-rule under which the groups operate and (a) the time required by the group to reach a decision, (b) the group members' satisfaction with the process,





and (c) the group members' commitment to the decision reached.

*Sub-problem II.* What relationship exists between the decision-rule employed and the time required to reach a decision?

*Sub-problem III.1.* What relationship exists between the decision-rule employed and the group members' satisfaction with the process?

*Sub-problem III.2.* What relationship exists between the decision-rule employed and the leaders' satisfaction with the process?

*Sub-problem III.3.* What relationship exists between the decision-rule employed and the individuals' satisfaction with the process?

*Sub-problem IV.1.* What relationship exists between the decision-rule employed and the group members' commitment to the decision reached?

*Sub-problem IV.2.* What relationship exists between the decision-rule employed and the leaders' commitment to the decision reached?

*Sub-problem IV.3.* What relationship exists between the decision-rule employed and the individuals' commitment to the decision reached?



### *Significance of the Problem*

Information relevant to the problem stated above was considered significant because of its potential contribution to the understanding of behavior in both small groups and larger organizations, and because of the link it could help to forge between small-group theory and organizational theory. In the small-groups field the problem was thought to have significance because its analysis could demonstrate a relationship between input (leader authority) and process (interaction patterns), and input and outcomes (decision time, satisfaction, and commitment). The importance of studies that demonstrate such linkages between inputs, intermediate interactive processes, and outputs was indicated in the introduction.

The relationships studied in connection with the problem were thought to have application to the study of organizations, because they could provide empirical evidence on which to base an evaluation of the recent trend toward increased involvement of subordinates in decision-making. For example, the study could indicate whether the group members' potential to influence the final decision, rather than their involvement *per se*, is a factor affecting such outcomes as commitment to the decision.

Finally, the problem was thought to have significance because the relationships established could help to strengthen the bridge between the small-group and organizational fields of study. The concept of authority as used in this study implies a larger



organization of which the group members are a part. Reference to the neglect of power as a variable in the study of small groups was made in the introduction. In addition, the use of decision-making groups has direct and broad application in the organizational setting.

### Delimitations

(a) Thirty subjects divided evenly into six groups made up the sample. All subjects at the time of the study were enrolled in graduate courses in educational administration at the University of Alberta. Most had had some experience in school administration and in decision-making in small groups.

(b) The study was experimental in nature and was conducted under laboratory-like conditions. The groups were created for the study and held their discussions in a television studio. The problems discussed by the groups were written descriptions of particular situations with which the subjects had had no personal involvement.

(c) The data were collected by: (i) the administration of instruments designed to measure commitment to decision and satisfaction with process, (ii) the use of a personal-data questionnaire completed by the subjects, (iii) the calculation of the duration of discussion sessions, and (iv) the recording of verbal interaction.



### Limitations

Results of the study should be examined critically in the light of certain limitations.

(a) Monetary and time costs made restriction of the scope of the study necessary. The cost of videotaping eighteen sessions was very considerable when the costs of cameramen, technicians and videotapes were included in the total. These monetary costs, while they were not charged directly to the researcher, restricted the services available to the project. Videotaping the sessions and coding interaction from the tapes were estimated to have required in excess of one hundred hours of time.

Restriction placed on the study by these costs made necessary the use of a small sample, which in turn placed restrictions on the general design. A sample of at least nine groups would have been required if an attempt had been made to control all possible interactions among the discussion problems, the order of sessions, and the decision-rules.

(b) All observations of interaction and all instruments were solely the result of the researcher's work. The results, therefore, could reflect biases brought about by the researcher's personal preferences or by his knowledge of the hypotheses being tested.

(c) The instruments used to test satisfaction with process and commitment to decision were developed for use with this study.





The fact that they were designed to be used only after rather lengthy discussion sessions had been completed made a pilot project of sufficient scope to provide data for tests of reliability and validity impractical. As a result, no evidence, beyond what was provided by the results of the study, was available concerning the reliability and validity of these instruments.

(d) The possibility of generalizing the findings of the study to some population was reduced both by the type of subjects used and the artificial laboratory-like conditions under which the discussions were conducted.

#### Definitions of Terms

Particular meanings are attached to certain words frequently used throughout this dissertation. Definitions of these words are given below.

*Group.* The definition is derived from Gibb (1947, p. 267). A group is two or more persons in a state of social interaction initiated in an attempt to solve a common problem or to reach a common goal. In its more specific sense the word refers to any one of the collections of five persons chosen at random to participate in the present study.

*Process.* A hypothetical construct--a label for all the behavior, both covert and overt, that took place in the interval between the time group members received information about their tasks and roles, and the time when the final decision was announced (Hoffman, 1960).



*Group member.* A group member is any one of the five persons assigned to an experimental group.

*Group leader.* A group leader is that member of an experimental group selected to act as chairman for all sessions and to exercise certain prerogatives in connection with the final decision depending upon the decision-rule under which the group operates.

*Individual.* An individual is a non-leader member of any of the experimental groups.

*Influence.* The definition is derived from Katz and Kahn (1966, pp. 218, 220). Influence is a kind of psychological force usually inferred from an interpersonal transaction in which one person acts in such a way as to change the behavior of another. Influence includes virtually any interpersonal transaction which has psychological or behavioral effects.

*Power.* The definition is that given by Katz and Kahn (1966). "Power is the potential for influence characteristically backed by the means to coerce compliance [p. 220]."

*Authority.* The definition is that given by Katz and Kahn (1966). Authority is

. . . legitimate power, power which is vested in a particular person or position, which is recognized as so vested, and which is accepted as appropriate not only by the wielder of the power but by those over whom it is wielded and by other members of the system [p. 203].



## Chapter Summary

Chapter I has presented the background to the problem, the significance of the problem, the problem, the sub-problems, the limitations and delimitations of the study, and the definitions of certain frequently used terms.

The problem was to determine the nature of the relationships that existed between the amount of leader authority (varied by altering the decision-rule under which the groups operated) and the patterns of interaction within groups, and also between the amount of leader authority and the time required to reach a decision, the members' commitment to the decision reached, and the degree of satisfaction with the process. Knowledge concerning these relationships was considered significant because of its potential contribution to the study of both small groups and organizations, and because of the link it might help to create between these two fields of study.



## CHAPTER II

### CONCEPTUAL FRAMEWORK

The primary aim of this study was to describe relationships between the decision-rules employed by small problem-solving groups and certain variables associated with both interaction patterns and outcomes. This chapter presents a conceptual framework based on an interpretation of interaction as a system of social exchange and on an analysis of decision-rules in terms of member authority.

The chapter begins with a presentation of theoretical concepts. This presentation is followed by an analysis of the independent variable (decision-rule) in terms of member authority. The remainder of the chapter is devoted to sections containing suggested relationships between the independent variable and each of the dependent variables (interaction patterns, decision-time, satisfaction with process, and commitment to decision). These suggested relationships are developed with reference to the theoretical formulations, and are supported whenever possible by research evidence.

#### Theoretical Considerations

Thibaut and Kelley (1959) describe interaction as the essence of interpersonal relationships and provide a definition:

The essence of any interpersonal relationship is interaction. Two individuals may be said to have formed a relationship when on repeated occasions they are observed to interact. By interaction it is meant that they emit behavior in each other's presence, they create





products for each other, or they communicate with each other. In every case we would identify as an instance of interaction there is at least the possibility that the actions of each person affect the other [p. 10].

Interaction is selective both with respect to who interacts with whom and with respect to the content of the interaction. Thibaut and Kelley (1959, p. 12) account for this selectivity in terms of the consequences of the interaction for the individuals involved. The consequences are described in terms of reward and cost.

The exchange theory of social behavior proposed by Homans (1958) has many elements in common with the Thibaut and Kelley (1959) formulation. Both look upon interaction between persons as an exchange of goods, material and non-material. Both describe the consequences of interaction in terms of rewards and costs to the individuals involved. And both imply that a person in his relationships with others will tend to stabilize his behavior at a point where the relationship can be maintained at the greatest profit (reward minus cost) to himself.

While a group exists each individual, according to the theory of exchange, will attempt to maximize the profit to himself by keeping his costs low and his rewards high. He will accept the influence of others in return for rewards that the group can offer him. He will continue to trade his opinion for rewards in this way until he perceives that his costs of doing so are too high to warrant continued bargaining. At the same time he will try to change the opinions of others to bring them closer to his own in order that his costs may be reduced.



These ideas of exchange provide direct support for two derivations from a theory development by Festinger (1966) entitled "A Theory of Social Comparison Processes." The first of these derivations states:

When a discrepancy exists with respect to opinions or abilities there will be tendencies to change one's position so as to move closer to others in the group [p. 156].

The second states:

When a discrepancy exists with respect to opinions or abilities there will be tendencies to change the opinions of others in the group to bring them closer to oneself [p. 156].

If exchange theory is to be useful in predicting behavior among group members, the concepts of reward and cost require further elaboration. Some sources of rewards and costs for members of problem-solving groups have been identified. Thibaut and Kelley (1959) suggest that rewards are ". . . pleasures, satisfactions, and gratifications the person enjoys. The provision of a means whereby a drive is reduced or a need fulfilled constitutes a reward [p. 12]." Festinger (1950) identifies two sources of pressures toward uniformity within a group. The first arises from a need to establish "social reality." This need arises from a desire to test the validity of opinions, attitudes, and beliefs for which there is no objective validation. Since the subjective validity of an opinion depends to a large extent on whether other persons share the same opinion, a discrepancy of opinion causes communication to arise in order that the discrepancy might be reduced. The second pressure toward uniformity arises because



uniformity is necessary if the group is to achieve some goal. These sources of pressure can be interpreted as needs, whose satisfaction constitutes reward.

Costs according to Thibaut and Kelley (1959) are ". . . any factors that operate to inhibit or deter the performance of a sequence of behavior [p. 12]." High cost is involved when ". . . great physical or mental effort is required, when embarrassment or anxiety accompany the action, or when there are conflicting forces or competing response tendencies of any sort [p. 13]." Homans (1958, p. 603) suggests that in situations where there is a choice between favorable alternatives the cost of a particular course of action must include the equivalent of the foregone value of the alternative. He also suggests a cost of compromise, associated with what he calls the "maintenance of one's personal integrity [p. 602]." The suggestion is that each time a person moves from a position that he knows in his own mind to be correct, some cost to himself is involved.

In summary, the consequences of interaction to a group member can be interpreted in terms of reward and cost. Each individual operating within a group will attempt to maximize his profit by reducing his costs and increasing his rewards. Certain costs and rewards for group members have been identified. The rewards include establishing "social reality" and reaching the group's goal. Costs include the value of a foregone alternative and the cost of compromise.





## Decision-rules and Authority

Power has been defined in Chapter I as the potential for influence. French and Raven (1959, pp. 155-156) have identified five bases of power: (a) reward power, based on B's perception that A has the ability to mediate rewards for him, (b) coercive power, based on B's perception that A has the ability to mediate punishments for him, (c) legitimate power, based on the perception by B that A has a legitimate right to prescribe behavior for him, (d) referent power, based on B's identification with A, and (e) expert power, based on the perception by B that A has some special knowledge or expertness.

Changing the decision rules under which groups operate can be interpreted, in terms of the categories of French and Raven, as a manipulation of legitimate power (authority). Altering the voting procedures by which a group must arrive at its final decision alters the potential for influence over the final decision that is granted individual members.

Under the centralist arrangement the leader is given the right to impose his decision upon the group. The other group members have no voting rights. Under the majority arrangement all members, including the leader, have equal voting rights, and no member operating alone can veto a decision. However, any three members who agree on a course of action have the right to disregard the wishes of the remaining members and make the decision for the group. Under the consensus





arrangement all members have equal voting rights; and since all must agree to the decision, any member operating alone can veto any decision.

The leader has his greatest authority under the centralist arrangement. Under this arrangement his right to influence the decision is clearly greater than that granted any other member. Whereas under the majority and consensus arrangements he is granted no greater potential for influence, aside from the authority granted him as chairman, than any other group member. A non-leader member, on the other hand, is granted the greatest potential for influencing the final decision under the consensus arrangement, for under this arrangement he has equal voting rights with all others, and he has the right of veto.

Thibaut and Kelley (1959) in their discussion of power distinguish between fate control and behavior control. "If by varying his behavior, A can affect B's outcome *regardless* of what B does, A has fate control over B [p. 102]." A second kind of power is called behavior control. "If by varying his behavior, A can make it desirable for B to vary his behavior too, then A has behavior control over B [p. 103]." Using this terminology the leader under the centralist arrangement has fate control over each individual and over the group as a whole. Under the consensus arrangement every member of the group has fate control over every other member and over the group as a whole. (If any one member refuses to cooperate under this arrangement the group is prevented from reaching a decision.) Under the majority arrangement each member has behavior control over every



other member. Only by forming a coalition can a group of members obtain fate control.

The sections following present arguments in support of the position that the potentials for influence inherent in the three decision-rules are related to interaction patterns, decision-time, satisfaction with process, and commitment to decision.

### Decision-rules and Interaction Patterns

This section presents suggestions of possible relationships between decision-rules and interaction patterns. These suggestions are developed with reference to the theoretical framework and are supported by what research evidence is available.

### *Source and Direction of Communications*

Under the centralist arrangement the leader has the authority to announce the final decision on behalf of the group. If he announces his decision early he gains the rewards arising from the satisfaction of the need to complete the group's task, while involving himself in no costs arising from the necessity to compromise. However, he would not likely announce his decision immediately because a possibility exists that he can increase his rewards, and therefore his profit, by identifying support for his position in others. Since he is not likely to gain such support from the group as a whole he would probably address his communications more to individuals from whom he anticipates support.



An individual (non-leader member), on the other hand, can increase his profit under the centralist arrangement by reducing the discrepancy between his position and the leader's position. If, as a group member, he is forced to accept a decision by the leader that is very different from what he feels is right, there is a high cost for him associated with his loss of personal integrity. He would tend, therefore, to attempt exchanges with the leader that would reduce this cost.

Under the majority arrangement all members have the right to vote, but each individual in order to have his position represented in the final decision must enlist the support of at least two others. Under these conditions a better balance between communications addressed to the leader, to the group as a whole, and to non-leader members might be anticipated.

Under the consensus arrangement every member, including the leader, has both the right to vote on the final decision, and to veto it. Under this arrangement the non-leader member has his greatest potential for influence on the final decision. Every member if he wishes his opinions to be reflected in the final decision must attempt to alter the opinions of all others in the direction of his position. The leader and all other members, therefore, would be expected to address their communications more to the total group than to specific others.

In summary, the leader might be expected to address more communications to individuals under the centralist arrangement than under the consensus arrangement; and he might be expected to address more





communications to the group as a whole under the consensus arrangement than under the centralist arrangement. Non-leader members might be expected to address more communications to the leader under the centralist arrangement than under the consensus arrangement; and they might be expected to address more communications to the group as a whole under the consensus arrangement than under the centralist arrangement. Under the majority arrangement less obvious differences in the direction of communications from both leaders and non-leaders might be anticipated.

Collins and Guetzkow (1964) provide a review of the research relating to power and its consequences in decision-making groups. In their review they point out that studies in this area approach the definition of power from two quite different viewpoints. Some studies define power by asking for a rating of each person on a scale of "influence," "power," "status," or "prestige." Others create power experimentally by making some potential for influence available to particular subjects. The approach used in the present study falls into the latter category. Collins and Guetzkow suggest, however, that the results are similar despite the differences in approach:

Persons with such experimentally developed power tend to behave in the same way as persons rated high on power by an observer or peer; so there is empirical justification for including data from both types of power definition [p. 153].

The suggestion has been made on the basis of exchange theory that under the centralist arrangement (where the leader has his greatest authority) non-leader members would tend to address more communications to the leader. Research provides support for this position. Collins and Guetzkow (1964) present the proposition that "when there is an





*established* power-status hierarchy, all group members will direct more communication to higher status persons [p. 172]." They provide a list of studies in support of their proposition:

But--as a simple descriptive fact--there is no lack of evidence to show that participants direct communication to persons high in power and status (Back *et al.*, 1950; Bates, 1952; Cohen, 1958; Collins, 1960; Festinger, 1948; Hurwitz *et al.*, 1953; Jackson, 1959; Kelley, 1951; Lippitt *et al.*, 1952; Miyamoto, Crowell, and Katcher, 1957; Sherif and Sherif, 1956, p. 226) [p. 172].

There is also ample evidence that high status-power persons initiate more communications. Collins and Guetzkow (1964) state after summarizing a number of studies (Borgatta, 1954; Caudill, 1958; Gerard, 1957; Hurwitz, Zander, and Hymovitch, 1953; Lana, Vaughan, and McGinnies, 1960; Mussen and Porter, 1959; Shaw and Gilchrist, 1956; and others) that ". . . in spite of wide differences in method of status measurement, a strong tendency for high power-status persons to initiate more communication is demonstrated [p. 156]."

The tendencies for high power-status persons to receive more communications and to initiate more communications are related, probably because when a person is spoken to he tends to reply. Bales, Strodtbeck, Mills, and Roseborough (1951) report that:

The findings reported indicate that if participants in a small group are ranked by the total number of acts they initiate, they will also tend to be ranked: (1) by the number of acts they receive, (2) by the number of acts they address to specific other individuals, and (3) by the number of acts they address to the group as a whole [p. 468].

In summary, although the research reported does not apply specifically to the suggestions presented concerning possible relationships



between decision-rules and communication patterns, it does provide indications of trends that might be expected as the leader's authority is reduced by the decision-rules. In particular, the findings indicate strong tendencies for the high power-status person both to receive and initiate more communications. As the leader's authority is reduced these tendencies could be expected to become less marked.

### *Content of Communications*

In the previous section suggestions were made as to possible relationships between the source and direction of communications and the decision-rule under which a group operates. In this section possible relationships between the content of the communications and the decision-rule are suggested. Because such relationships are much more difficult to anticipate from the theory, only a very general trend is suggested.

Under the consensus arrangement every member, including the leader, finds himself in the same situation. Each has the right to vote; and because all must agree before a decision is final, each has the right to veto. According to exchange theory, if differences of opinion are assumed, all members could be expected to interact until an equilibrium point is reached at which each of the members feels he has maximized his rewards and minimized his losses. Every member, therefore, could be expected to bargain with every other, granting support for some parts of the arguments of others in return for their support for some of his arguments.



Under the centralist arrangement, since the leader can announce the decision whenever he wishes, only one member (the leader) must be satisfied with the balance of reward and cost before the decision is reached. Under the majority arrangement only a majority of the members needs to be satisfied.

A larger number of communications specifically designed to influence could be expected under the consensus arrangement, therefore, than under either of the other two arrangements. Group members under consensus might be expected to give more positive reactions, more opinions and suggestions, and more information, than under the centralist or the majority arrangements. The anticipated trend would be for communications of this type to increase as the decision-rule changed from centralist, to majority, to consensus.

In summary, based on the theory of social exchange, suggestions have been made concerning possible relationships between the independent variable, decision-rule, and one of the dependent variables, interaction pattern. Relationships were suggested between the decision-rules and both the content and the source and direction of communications. The sections which follow indicate possible relationships between decision-rules and three other dependent variables, decision-time, satisfaction with process, and commitment to decision.

#### Decision-rules and Decision-time

An argument is presented in this section for a relationship between the decision-rule employed and the time required by a group





to reach a decision. A summary of a research project is presented in partial support of the argument.

According to exchange theory each individual operating within a group attempts to maximize his profit by reducing his costs and increasing his rewards. Under the centralist arrangement, therefore, the leader could be expected to allow the discussion to continue only until he perceives that there is no possibility of increasing his reward. He will adjourn the meeting when his rewards in terms of increased social support are balanced by his costs of compromise. Under the majority arrangement the group must continue discussion until more than one-half of the members have reached an acceptable compromise. When the members of this majority group perceive that they cannot increase their profit through further negotiations with the remaining members they could be expected to cause the meeting to be adjourned. Under the consensus arrangement the interaction among members could be expected to continue until every member perceives that he can gain no more by further bargaining.

Since under the centralist arrangement only one member must be satisfied with his profit before the meeting is adjourned, while under the majority arrangement a majority must be satisfied, and under consensus all must be satisfied, the amount of time required to reach a decision could be expected to increase as the decision-rule changes from centralist, to majority, to consensus.

A study by Bower (1965) provides partial support for this argument. The data were obtained from committees of three men who





communicated to each other by means of written notes only. Each subject was instructed that he belonged to a three-man committee that was to choose one from one hundred twenty-five possible investment projects. Each group was assigned one of two methods of making a decision. In one case there was a requirement of unanimity; in the second a majority ruled. The amounts of money to be paid to individual members of the winning committee were manipulated in order to create groups in which cooperation was the most rational behavior (teams), and groups in which competition to have one's own ideas accepted by the committee was the expected behavior (foundations).

The time allowed for the committees to reach a decision was limited. The results indicated that the committees, particularly those in which the members were competing one with the other (foundations) had more difficulty reaching a decision under the unanimity requirement. In the time allowed considerably more decisions were reached under the majority arrangement than under the unanimity arrangement.

#### Decision-rules and Satisfaction with Process

This section includes suggestions of possible relationships between the independent variable, decision-rule, and the members' satisfaction with process. If the assumption is made that an individual's satisfaction with process is closely associated with his perception of his profit, as the term is used in exchange theory,



then suggestions of possible relations between decision-rules and member satisfaction can be made within the framework of exchange theory. Suggestions for leaders and non-leaders are considered separately.

The leader under the centralist arrangement has the authority to terminate discussion and announce a decision at any time. He could be expected to take this action at the point in the discussion where he perceives that any further increment of profit to himself would be at least balanced by some further costs. His perception of his own profit determines when discussion ceases.

Under the majority and consensus arrangements the leader has much less control over his profit. He, like each of the other members must bargain, and may have to assume large costs of compromise in order to retain certain rewards. As a result, he would probably perceive his profit, and therefore his satisfaction, to be less under either of these arrangements than under the centralist arrangement.

For the other group members the situation is reversed. Under the centralist arrangement the non-leader member whose opinion differs from that of the leader is in a poor bargaining position. He has no voting rights and he has no right to veto the final decision. His profit, or lack of it, depends almost entirely on the behavior of the leader. Under the consensus and majority arrangements, on the other hand, all members have equal voting rights, and if opinions differ all must compromise to some degree if a decision is to be



reached. Under these latter conditions the non-leader member would have a greater possibility of retaining what Homans (1958) calls "personal integrity," since the final decision is likely to reflect his opinion, at least in part. The expectation, therefore, would be for leaders to express greatest satisfaction with the process under the centralist arrangement, and for non-leaders to express least satisfaction with the process under this arrangement.

Findings from small group studies which involve the use of modified Bavelas (1950) communication nets provide support for the arguments presented above. A number of these studies (Cohen, Bennis, and Wolkow, 1962; Guetzkow and Simon, 1955; Leavitt, 1951; Shaw, 1954) indicate that individuals in more central positions (determined by the number of persons to whom one can communicate directly) report greater satisfaction than those in less central positions.

Different interpretations of the nature of this phenomenon have been presented. Leavitt (1951) emphasizes centrality *per se*. Mulder (1960) interprets the results in terms of the exercise of power, which he defines as ". . . the determination of the behavior of others [p. 242]." He states:

Our conclusion is that the exercise of power appears to be in general a primary determinant of the person's satisfaction and also that the satisfaction of more central persons and key men in the communication structure experiments by Leavitt, Shaw, and Guetzkow and Simon, is a function of the exercise of power [p. 253].

Heslin and Dunphy (1964) interpret the findings in terms of member participation. They suggest that high participation is





positively related to satisfaction, since members in central positions have higher satisfaction than those in less central positions. They conclude:

From communication net studies, it therefore appears that: groups with more equally distributed participation have a higher average member satisfaction than groups with unequal participation among members [p. 106].

The interpretations by Mulder (1960) and Heslin and Dunphy (1964) may not be as dissimilar as they first appear. Attention has already been drawn to the fact that a strong relationship exists between an individual's power and the amount of communication he initiates and receives. "Participation" and "power", therefore, are closely related concepts as far as their application to small groups is concerned.

Mulder's interpretation provides support for the argument that the leaders should be more satisfied under the centralist arrangement, since under this arrangement they have more authority. The interpretation by Heslin and Dunphy suggests that non-leader members should be more satisfied under the consensus and majority arrangements, because under these decision-rules they would probably have more opportunity to participate both in the discussion and in the making of the final decision.

#### Decision-rules and Commitment to Decision

Commitment to decision refers to the degree of certainty held by group members concerning the appropriateness and wisdom of the decision reached. In this final section suggestions are made as to possible relationships between the decision-rule employed and the





members' commitment to the decision reached. Again, suggestions as to the leaders' behavior will be developed separately from the suggestions concerning non-leader members.

Two assumptions are made in order that suggestions of possible relationships might be developed within the framework of exchange theory. First, it is assumed that every member comes to the discussion session with preconceived ideas concerning the best course of action to be followed. Second, it is assumed that the degree of each member's commitment will be strongly influenced by the extent to which his ideas are represented in the final decision.

The leader under the centralist arrangement could be expected to continue to exchange with other members only until he perceives no further profit for himself. If the leader values his opinion more than he values the support of others, the expectation would be that the final decision would contain many of the essential elements of his preconceived opinion and few of the elements of opposing views. The ideas of non-leader members are represented in the final decision only if they happened to agree with those of the leader.

Under the majority arrangement every member is forced to exchange his opinions for the support of others. If a member is successful in his attempt to form a coalition with the majority he could expect that some of his ideas would be included in the final decision. If, however, others form a coalition that excludes him, his ideas may not



be represented, and he may have little commitment to the decision reached.

Under the consensus arrangement no decision can be reached until every member is satisfied that he has gained as much profit as possible. All members, therefore, would probably be forced to accept considerable cost associated with compromise in order to gain rewards arising from having at least some of their ideas accepted by the group.

The suggested relationships are, therefore, that the leader should be more committed to the decision under the centralist arrangement than under either the majority or the consensus arrangement. A non-leader member could be expected to be less committed to the decision under the centralist arrangement than under either of the other two arrangements. Under the centralist arrangement his opinions are represented in the decision only if the leader should agree to accept them. The other arrangements, under which all members have the right to vote, provide the non-leader member with a stronger bargaining position. He has his greatest potential for influence under the consensus arrangement where he has the right to delay the decision until his views are given some acceptance.

A series of experiments conducted in the Lewinian tradition and summarized by Katz and Kahn (1966, pp. 395-404) indicate some support for the suggested relationship between the majority and consensus decision-rules and the increased commitment of non-leader members (Bond, 1956; Coch and French, 1948; Lewin, 1952; Radke and Klisurich, 1947). These experiments followed a similar pattern. Attempts were



made to have persons change their patterns of behavior. Some groups received a lecture pointing out the advantages of the change, while others were involved in group discussion and decision. In all cases the superiority of the group discussions with regard to creating new patterns of behavior was demonstrated.

These findings do not provide direct support for the relationship suggested above, however, because they do not indicate whether the outcomes were different because of the group members' potential to influence the final decision or because of their involvement *per se*. A study by Bennett (1955) provides some data relating to this question. Her study permitted the independent manipulation of four separate factors: lecture vs. group discussion, whether or not members made a decision, public vs. private commitment to the decision, and the degree of consensus in the group. Neither group discussion itself nor the degree of public commitment had any effect on the number of students who later volunteered for an assignment. However, both bringing an individual to the point of decision, and the perception of high group agreement had an effect on commitment to the decision reached. This finding applies directly to the present situation, since the majority and consensus arrangements require both a personal decision by all members and an indication of the degree of consensus.

### Chapter Summary

Chapter II has presented the conceptual framework for the study based on an interpretation of interaction as a system of social exchange



and on an analysis of decision-rules in terms of member authority.

Suggestions based on the theoretical framework were made concerning possible relationships between the independent variable (decision-rule) and the dependent variables (interaction patterns, decision-time, satisfaction with process, and commitment to decision). Wherever possible the suggestions concerning possible relationships were supported by research findings.







## CHAPTER III

### RESEARCH DESIGN AND PROCEDURES

The purposes of this chapter are to present the general design of the research, to provide a description of the sample and the discussion problems used, to outline specific procedures employed in connection with the videotaping of the sessions, with the data collection, and with the data analysis, and to describe the development of the instruments used in the study.

#### General Considerations

##### *Design*

The study was structured around a repeated measures design with three treatments applied to each of six groups. In total, six five-man groups were involved. Each group met three times to reach a decision concerning an educational problem presented to it in the form of a written case study. The sessions for any one group were spaced at intervals of not less than ten days. At each meeting each group was assigned a different case to discuss and a different decision-rule (treatment) under which to operate. When the eighteen sessions had been completed, therefore, each group had been exposed to the same three case studies and had operated under the same three decisions-rules, but in differing combinations and sequences.

The three decision-rules, the three sessions, the three discussion problems, and the six groups were combined in a manner designed



to control a number of variables presumed to influence the behavior of group members in a problem-solving situation. Variables associated with the composition of the group such as personality, age, sex, educational experience, and group size, as well as other variables, less easily measured, such as leadership styles, other sources of power available to the leader, structures of interaction that may have developed, and the effects of a particular discussion problem were controlled by the design. The arrangement of problems and sessions combined with each decision-rule for each group is given in Table I.

TABLE I

## ARRANGEMENT OF PROBLEMS AND SESSIONS BY DECISION-RULE

Group	Decision-rule		
	Centralist	Majority	Consensus
A	$S_1P_1^a$	$S_3P_2$	$S_2P_3$
B	$S_2P_2$	$S_1P_3$	$S_3P_1$
C	$S_3P_3$	$S_2P_1$	$S_1P_2$
D	$S_2P_3$	$S_1P_1$	$S_3P_2$
E	$S_3P_1$	$S_2P_2$	$S_1P_3$
F	$S_1P_2$	$S_3P_3$	$S_2P_1$

<sup>a</sup> $S_1P_1$  refers to a combination of the first session and the first problem.



The arrangement shown in Table I met the following conditions:

(a) All groups operated once only under each of the three decision-rules, and addressed themselves once only to each of the discussion problems.

(b) Each decision-rule was used with two groups whose members had had no previous experience together, with two groups whose members had already been together for one session, and with two groups whose members had already been together for two sessions. This arrangement was designed to control the effects of learning and interaction structuring over the three sessions.

(c) Each of the three discussion problems was placed in combination twice with each of the three decision-rules. Under this arrangement any direct effects of the problem being discussed on such criterion measures as time to reach a decision, commitment to decision, and satisfaction with the process, were assumed to be controlled when these criterion measures were totalled under each treatment.

(d) Each of the three problems was used with two groups whose members had had no previous experience together, with two groups whose members had already been together for one session, and with two groups whose members had already been together for two sessions. This arrangement was used in an attempt to control the possibility that structuring and learning that might have taken place as the groups met over the three sessions could have affected the performance of groups discussing one problem more than if they had been discussing some other problem.



### *Description of the Sample*

The sample consisted of thirty subjects divided into six five-man groups. A table of random numbers was used to select the subjects for each group from the class lists of a graduate course in educational administration. Names of students who were female, or who might not have been familiar with the Alberta educational system, or who might have had difficulty with the English language were eliminated from the lists before the selection was made. The person named last to each group was designated chairman for the group.

The ages of the 30 male subjects ranged from 25 to 43 years, with a mean of 31.1 years. The total number of years spent working in the educational field ranged from 2 to 18 years, with a mean of 6.7 years. The number of years spent by the subjects in educational administration ranged from zero to nine years, with a mean of 1.9 years.

### *Description of the Discussion Problems*

The same three problems for discussion were presented to each of the six groups. The problems were written case studies of school situations relating to the general areas of staff personnel, pupil personnel, and curriculum. One of the criteria for their selection was that they must permit a number of possible solutions.

### *Procedures for Discussion Sessions*

All discussion sessions were held in the television studio of the Audio-Visual Media Center of the Faculty of Education. Group







members were seated at small individual tables prearranged to form a tight "V" pattern. The chairman was seated at the head of the "V" facing the other four members. The other members sat on the same side of the chairman for all sessions. In most cases they took the same seats for each of the three meetings.

The case studies were distributed to each of the five members of the group at least two days prior to each of the discussion sessions. The members were instructed to become thoroughly familiar with the materials and to record in advance of the session, the procedures that they would personally recommend in an attempt to ease the problem situations presented in the cases. The written decisions were required in an attempt to ensure that the case material was carefully read and that the subjects would take a position with respect to the issues presented. Group members were instructed that under no circumstances were they to discuss the cases with any other subjects at any time before all discussion sessions had been concluded.

At the beginning of each session the decision forms completed by the subjects were collected by the researcher, and written descriptions of both the role to be played by each member and the rules under which the group was to operate were distributed to the subjects. Two different forms were used to describe the roles and rules, one for the leader, and one for all other group members. The two descriptions contained the same information, but the wordings differed slightly according to the persons to whom they were addressed. These procedural descriptions are reproduced in Appendix A.



When group members had had sufficient time to study the descriptions of procedure the leader was asked by the researcher to describe aloud the rules under which the group would operate. Following the leader's description the researcher provided any necessary clarification, and encouraged all group members to ask questions in order to ensure that the procedures were clearly understood before the session began. No indication was given as to the rules that would be prescribed for later sessions.

Before the signal was given for discussion to begin the groups were informed that they might keep the cases for reference during their discussions, that they must reach a decision before adjourning, and that the decision they reached would be compared to those reached by other groups meeting under similar circumstances. They were told also that there would be no time limit placed on their discussions, that the sessions would be videotaped for future reference, and that the researcher would make certain unspecified observations. They were asked to make no references to the researcher and to ask no questions of him.

Immediately following the adjournment of each discussion session, and before group members had an opportunity to discuss the session among themselves, subjects were asked to complete two instruments. The first was designed to test the members' commitment to the decision just reached; the second was designed to test their reactions to the process by which the decision was reached. The instruments are reproduced in Appendix B. If an instrument appeared



to have been completed too hurriedly, or if the responses appeared contradictory, the instrument was returned immediately to the respondent with a request that he make a check to determine whether his responses correctly reflected his intent. The instrument was accepted the second time without comment.

### *Pilot Project*

A pilot project was carried out to determine the feasibility of the larger study, and to refine the procedures and techniques that were to be used in connection with it. A total of four groups each containing four members constituted the sample. Problems associated with obtaining subjects made necessary the use of both males and females as subjects. All subjects were members of an undergraduate psychology course. Each group met twice, once under the centralist arrangement, and once under the consensus arrangement. All sessions were videotaped in the Small Groups Laboratory of the Department of Sociology.

The pilot project, in addition to indicating the feasibility of the present study, provided the researcher with practice in coding interaction from videotapes and indicated a number of areas in which techniques could be improved. The discovery was made, for example, that the small television camera, which was mounted some distance from the groups involved, produced a picture from which it was sometimes difficult to determine to whom a communication had been addressed. In addition, a tendency was noted on the part of subjects to make





the same numerical response to all items of the process and decision instruments. To counteract this tendency some of the items of both instruments were re-written in such a way that a high numerical response indicated low rather than high satisfaction or commitment.

### Videotaping Procedures

All discussion sessions for the major project were held in the television studio of the Audio-Visual Media Center of the Faculty of Education, where each session was videotaped in its entirety. Technicians and equipment were provided by the Media Center.

To film the interaction within the groups, two cameras were employed simultaneously to produce a vertically-split composite picture. Three members of the group appeared on one side of the vertically-split screen and two others, photographed by the second camera, appeared on the other side. This technique, while it created some spatial distortion in the picture, had the advantage of permitting a closer and more direct view of the subjects during their discussions.

In an attempt to reduce the artificiality of the environment no floodlights were used during the filming. The pictures produced, although lacking in contrast, were adequate for the purpose. The cameras were not hidden, but during informal talks with the researcher subjects volunteered the information that they soon forgot that the sessions were being filmed once they became involved in trying to reach decisions about the problems presented to them. The leaders,





who because of their seating position were looking directly into the cameras, indicated the strongest awareness of them.

### Interaction Recording

#### *Interaction Categories*

Interaction was coded using categories derived from Bales' Interaction Process Analysis (Bales, 1950). Bales' (I.P.A.) categories were chosen in preference to others for two reasons. First, the I.P.A. categories were developed for and had been applied successfully with task-oriented, problem-solving groups similar to the ones used in this study. Second, because Bales' categories had been used for the analysis of interaction in a large number of studies they provided a common foundation upon which comparisons between the findings of this study and other studies could be based. The twelve I.P.A. categories are illustrated in Table II.

For the purposes of this study both the categories of interaction and the method of recording the source and direction of communications were modified. The twelve categories defined by Bales were combined to form six as suggested by Hemphill (1968). Bales' categories 1, 2, and 3 (shows solidarity, shows tension release, and agrees) were combined to form category 1 and were assigned Bales' term "positive reaction." Categories 4 and 5 (gives suggestion and gives opinion) were combined to form category 2, which was named "gives advice." Bales' category 6 (gives orientation) was designated category 3 and called "gives information." Category 7



TABLE II

CATEGORIES FOR INTERACTION PROCESS ANALYSIS<sup>a</sup>

Social- Emotional Area: Positive	A	1	<i>Shows solidarity, raises other's status, gives help, reward:</i>						
		2	<i>Shows tension release, jokes, laughs, shows satisfaction:</i>						
		3	<i>Agrees, shows passive acceptance, understands, concurs, complies:</i>						
Task Area: Neutral	B	4	<i>Gives suggestion, direction, implying autonomy for other:</i>						
		5	<i>Gives opinion, evaluation, analysis, expresses feeling, wish:</i>						
		6	<i>Gives orientation, information, repeats, clarifies, confirms:</i>	a	b	c	d	e	f
	C	7	<i>Asks for orientation, information, repetition, confirmation:</i>						
		8	<i>Asks for opinion, evaluation, analysis, expression of feeling:</i>						
		9	<i>Asks for suggestion, direction, possible ways of action:</i>						
Social- Emotional Area: Negative	D	10	<i>Disagrees, shows passive rejection, formality, withholds help:</i>						
		11	<i>Shows tension, asks for help, withdraws out of field:</i>						
		12	<i>Shows antagonism, deflates other's status, defends or asserts self:</i>						

a Problems of communication

b Problems of evaluation

c Problems of control

d Problems of decision

e Problems of tension reduction

f Problems of integration

A Positive reactions

B Attempted answers

C Questions

D Negative reactions

<sup>a</sup>Robert F. Bales, *Interaction Process Analysis* (Cambridge, Massachusetts: Addison-Wesley Press, Inc., 1951), p. 9.



was renamed "asks information" and designated category 4. Categories 8 and 9 (asks for opinion, and asks for suggestion) were combined to form the new category 5, "asks advice." Finally, Bales' categories 10, 11 and 12 (disagrees, shows tension, and shows antagonism) were combined to form category 6, which was assigned Bales' title, "negative reaction." The relationships between Bales' categories and those used by Hemphill are given in Table III.

Hemphill (1968) gave two reasons for combining the I.P.A. categories in his study of verbal interaction in school board meetings:

First, the number of acts coded in each of Bales' categories 1, 2, 3, 10, 11, 12 was so small as to be almost negligible. Second, preliminary interaction category reliability analyses and discussion with coders indicated a high degree of difficulty in differentiating between acts which were opinion and those which were suggestion [p. 44].

A problem similar to that described by Hemphill was encountered during the pilot project. Only about 20 per cent of the total number of responses fell into the social-emotional areas, which included six of Bales' categories. It became obvious that only by combining these categories could a sufficient number of responses be obtained to conduct a meaningful analysis.

A further consideration in connection with the present study made it necessary to limit the number of content categories employed. Since each content category was to be subdivided five times (as described below) to indicate the source and direction of the communication acts, the use of 12 content categories would have created a total of 60 categories. With such a large number of categories the number of





TABLE III  
COMPARISON OF INTERACTION CATEGORIES  
FOR THE PRESENT STUDY WITH  
THOSE OF BALES<sup>a</sup>

Bales' Categories		Present Study Categories	
Number	Description	Number	Description
1	Shows solidarity	1	Positive reaction
2	Shows tension release		
3	Agrees		
4	Gives suggestion	2	Gives advice
5	Gives opinion		
6	Gives orientation	3	Gives information
7	Asks for orientation	4	Asks for information
8	Asks for opinion	5	Asks for advice
9	Asks for suggestion		
10	Disagrees	6	Negative reaction
11	Shows tension		
12	Shows antagonism		

<sup>a</sup>Robert F. Bales, *Interaction Process Analysis* (Cambridge, Massachusetts: Addison-Wesley Press, Inc., 1951).





responses in each would have been small, and the analysis and interpretation of data would have become unnecessarily complex.

Since a reduction in the number of categories was necessary the decision was made to combine only adjoining categories, and not to combine social-emotional categories with task-area categories. In the task area, categories associated with problems of evaluation and control were combined because of the close relationship these problems bear one to the other.

Since in this study the source and direction of communication acts were considered to be as important as their content, each of the six content categories described above was subdivided into five source-and-direction categories to produce a total of 30 categories. Because the independent variable in this study was the amount of legitimate power assigned the leader, communications to and from the leader were considered separately, while communications to and from other group members were considered collectively. Communications that were addressed to no particular individual member were considered to have been addressed to the group as a whole. The five source-and-direction categories, therefore, were "leader to group," "leader to individual," "individual to group," "individual to leader," and "individual to individual." Figure I, the form used to code interaction, shows the 30 categories formed when content categories and source-and-direction categories were combined.



	Positive Reaction	Gives Advice	Gives Information	Asks Information	Asks Advice	Negative Reaction
Leader to Group						
Leader to Individual						
Individual to Group						
Individual to Leader						
Individual to Individual						

FIGURE I

INTERACTION CODING FORM



### *Coder Training*

All coding was carried out by the researcher working alone. The pilot project described earlier provided the coder with approximately eight hours of practice in coding. Prior to and during the period in which the pilot study was being conducted frequent reference was made to the extended definitions of each category as provided by Bales (1950). In addition to this practice the researcher, in order to refresh his memory, reread some of the tapes from the pilot project immediately prior to the start of the discussion sessions held in conjunction with this research.

### *Coding Interaction*

The coding of interaction was carried out under the assumption that the 30 categories were exhaustive and mutually exclusive. That is to say, every unit of interaction was coded, and no unit was recorded in more than one category. The coding was carried out by placing a tally mark under the appropriate category on the interaction coding form (Figure I).

The unit of interaction was any segment of verbal behavior that contained a complete idea. The unit, therefore, could be a single word, a phrase, a clause, or a sentence. No non-verbal behavior was recorded except in the most obvious cases where a group member substituted a head movement for a verbal response to a direct question.

All sessions were coded at least four times. The first codings were carried out while the groups were actually in operation.





These "live" readings were followed by three others taken from the videotapes. The choice of three additional readings was made because experience showed that the results from the second and third tape readings were usually very similar. Each new coding was made without reference to the previous codings of that particular session. In a few cases where there was considerable variation within one or more categories even after the third tape reading, an additional reading was made in which special attention was given to those acts which might fall in the category or categories in question. In all cases, only data from the final readings were used in testing the hypotheses.

#### *Reliability of coding*

Since all the coding was carried out by the researcher the possibility existed that the high similarity between the second and third readings from the tapes had been brought about not so much by a standard frame of reference that had been adopted by the coder as by the fact that it was possible to remember from one reading to the next how certain marginal acts had been classified. To test the temporal consistency of the coding three videotaped sessions were selected at random from the original eighteen for rereading seven weeks after the last tape had been read. Following a practice session in which two other tapes were coded, the three selected tapes were each read once using the same procedures and forms as before. During the period in which the practice and rereading were carried out no references



was made to the original codings.

On the assumption that the interaction counts were at least interval data, Pearson product-moment correlation coefficients were used as measures of reliability. The correlations between the number of acts recorded in each of the thirty categories during the original and test readings for sessions six, seven, and eleven ranged from .94 to .96. These correlations indicated a high consistency of coding over time.

### Instrumentation

In order to determine the degree of the subjects' commitment to the decisions reached and the degree of their satisfaction with the decision-making process two instruments were developed. For ease of reference these instruments were called the decision instrument and the process instrument, respectively.

Since the instruments were designed for use following group decision-making sessions, and since a large number of such sessions could not be held for the sole purpose of gathering data to assist in the development of the instruments, a decision was made that a number of items with face validity with respect to the variables to be measured would be administered to the subjects, and that subsequent analyses would be used to determine those items whose scores would be included in the final totals. Eight items were selected for the original decision instrument and fifteen for the original process instrument (Appendix B). During the course of data collection each



instrument was completed 90 times, three times by each of the subjects.

### *The Decision Instrument*

The original decision instrument contained eight items. To determine whether these eight items would form a factor distinct from those formed by the 15 items of the process instrument a factor analysis was performed on the 23 items from the two instruments combined. Because the number of responses to the items was relatively small, and because no previous analyses had been carried out on the items, only items with positive factor loadings of .500 and above were considered. On this basis seven of the eight items from the decision instrument and none of the items from the process instrument were included under the first factor.

Item three of the decision instrument, because its loading on the first factor was slightly less than the required .500, and because its loading on another factor was above .500, was eliminated (Appendix C). A subsequent factor analysis of the seven remaining items taken alone indicated that they sampled a single dimension. Factor loadings from a varimax rotation are given in Table IV. The final decision instrument consisted of these seven items.

### *The Process Instrument*

The first analysis, in addition to indicating that seven of the original decision items formed a single factor, indicated that the process items were not nearly so highly correlated one with another as





TABLE IV  
VARIMAX SOLUTION FOR THE DECISION INSTRUMENT

Item Number	Factor I	$h^2$
1	.860	.740
2	.891	.794
3	.858	.736
4	.877	.770
5	.928	.861
6	.862	.744
7	.834	.696
Sum of factor loadings squared	5.340	5.340





were the decision items, and that these items appeared to sample more than one dimension. As a first step in developing the process instrument, items six and nine, because their correlations with other items were consistently low and because they alone formed the final factor in the first factor analysis, were eliminated.

The remaining 13 items were submitted to a second factor analysis using a varimax rotation. The number of factors was determined using the procedure suggested by Linn (1968). He suggested that a break in the curve obtained when the eigenvalues are plotted on a graph should indicate the number of factors to select. Using this criterion it was decided that three factors should be used. Items with positive factor loadings in excess of .500 were selected. On this basis seven items were assigned to the first sub-scale, three to the second, and three to the third. Titles assigned the sub-scales were: I. Performance Facilitation, II. Task Achievement, III. Discussion Adequacy. Factor loadings are presented in Table V.

The items of the "performance facilitation" sub-scale appeared to test the extent to which each group member approached the discussion sessions in a manner that permitted an open expression of ideas in a sincere attempt to solve the problems facing the group.

The responses to the items of the "task achievement" sub-scale seemed to reflect the degree of satisfaction that arose directly from task performance. Support for this conclusion was found in the fact that this sub-scale contained two of the three process items that showed consistently strong correlations with the seven items of the



TABLE V

VARIMAX SOLUTION FOR PROCESS INSTRUMENT - THREE FACTORS

Item Number	I	II	III	$h^2$
	Performance Facilitation	Task Achievement	Discussion Adequacy	
1	.611	.267	.240	.502
2	.627	.390	.209	.589
4	.608	-.044	.424	.551
8	.757	.098	.123	.598
9	.655	.238	-.058	.489
10	.714	.272	-.065	.588
11	.761	.034	.202	.621
3	.034	.772	.220	.645
6	.203	.684	.060	.513
13	.290	.756	.016	.655
5	.033	.084	.746	.565
7	.113	.047	.715	.526
12	.250	.357	.551	.494
$\Sigma$ factor loadings squared	3.429	2.138	1.769	7.336



decision instrument. The correlations of item one of the "task achievement" sub-scale with the seven decision items ranged from .28 to .44, while the correlations of item three with the decision items ranged from .32 to .53.

Items of the "discussion adequacy" sub-scale appeared to test the degree of satisfaction with the amount of discussion that preceded the final decision. The possibility existed that the responses to the items of the sub-scale might bear a positive relationship to responses to the items of the "task achievement" sub-scale, since a respondent who received little satisfaction from the outcome of deliberations might be expected to attribute his dissatisfaction with the outcome to the inadequacy of the discussions that preceded it. To check this possibility a factor analysis was carried out using two factors rather than three with a varimax rotation. The results indicated that the six items of sub-scales II and III, and only those six items, had factor loadings in excess of .500 on the second factor. Additional evidence of a possible relationship between sub-scales II and III is given by the fact that the first item of sub-scale III, like the first and third items of sub-scale II, showed strong correlations with the seven items of the decision instrument. The correlations ranged from .24 to .39.

### Hypotheses

The hypotheses that were tested arose directly from the sub-problems listed in the first chapter. They were stated as null





hypotheses suitable for testing by Friedman's two-way analysis of variance. The hypotheses were divided into two major groupings, those associated with process (interaction patterns) and those associated with outcomes (satisfaction with process, commitment to decision, and time required to make the decision).

### *Hypotheses Associated with Process*

The hypotheses in this section were arranged in terms of two major dimensions of interaction, attribution and content. Five categories of attribution (leader to group, leader to individual, individual to group, individual to leader, and individual to individual) and six categories of content (positive reaction, gives advice, gives information, asks information, asks advice, negative reaction) were considered.

The two major dimensions were first examined separately, and then in combination, in an attempt to determine possible differences in interaction patterns under the three decision-rules. In addition, some of the attribution categories were considered in combination before being considered individually.

*Hypothesis I.1.* No significant differences exist in the mean ranks of the total number of communications initiated by group members when the groups operate under the centralist, the majority, and the consensus arrangements.



*Hypothesis I.2.* No significant differences exist in the mean ranks of the total number of communications initiated by the leader when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.3.* No significant differences exist in the mean ranks of the total number of communications initiated by individuals when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.4.* No significant differences exist in the mean ranks of the total number of communications from the leader to the group when the groups operate under the centralist, the majority and the consensus arrangements.

*Hypothesis I.5.* No significant differences exist in the mean ranks of the total number of communications from the leader to an individual when the groups operate under the centralist, the majority and the consensus arrangements.

*Hypothesis I.6.* No significant differences exist in the mean ranks of the total number of communications from individuals to the group when the groups operate under the centralist, the majority and the consensus arrangements.

*Hypothesis I.7.* No significant differences exist in the mean ranks of the total number of communications from individuals to the leader when the groups operate under the centralist, the majority, and the consensus arrangements.



*Hypothesis I.8.* No significant differences exist in the mean ranks of the total number of communications from individuals to other individuals when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.9.* No significant differences exist in the mean ranks of the total number of communications recorded in the "positive reaction" category when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.10.* No significant differences exist in the mean ranks of the total number of communications recorded in the "gives advice" category when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.11.* No significant differences exist in the mean ranks of the total number of communications recorded in the "gives information" category when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.12.* No significant differences exist in the mean ranks of the total number of communications recorded in the "asks information" category when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.13.* No significant differences exist in the mean ranks of the total number of communications recorded in the "asks advice"



category when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.14.* No significant differences exist in the mean ranks of the total number of communications recorded in the "negative reaction" category when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.15.* No significant differences exist in the mean ranks of the number of communications from the leader to the group within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.16.* No significant differences exist in the mean ranks of the number of communications from the leader to an individual within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.17.* No significant differences exist in the mean ranks of the number of communications from individuals to the group within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis I.18.* No significant differences exist in the mean ranks of the number of communications from individuals to the leader within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements.





*Hypothesis I.19.* No significant differences exist in the mean ranks of the number of communications from individuals to other individuals within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements.

#### *Hypotheses Associated with Outcomes*

The hypotheses in this section are arranged in terms of three outcomes: time required to reach decisions, satisfaction with the process, and commitment to the decision.

*Hypothesis II.* No significant differences exist in the mean ranks of the number of minutes required to reach a decision when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis III.1.* No significant differences exist in the mean ranks of the group members' scores on the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis III.2.* No significant differences exist in the mean ranks of the leaders' scores on the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis III.3.* No significant differences exist in the mean ranks of the individuals' scores on the process instrument when the



groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis IV.1.* No significant differences exist in the mean ranks of the group members' scores on the decision instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis IV.2.* No significant differences exist in the mean ranks of the leaders' scores on the decision instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

*Hypothesis IV.3.* No significant differences exist in the mean ranks of the individuals' scores on the decision instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

### Data Analysis

To test the hypotheses listed above the Friedman two-way analysis of variance by ranks was used. The Friedman test was followed by a comparison of the treatments in pairs using the Wilcoxon matched-pairs signed-ranks test. The use of these non-parametric tests is somewhat analogous to the use of the parametric one-way analysis of variance with repeated measures followed by the Newman-Keuls comparison of means. However, by using the non-parametric tests



many of the assumptions underlying the use of the parametric tests were avoided.

### Chapter Summary

Chapter three has presented a description of the design and of the specific procedures employed in the study. Descriptions of the general design, the sample, and the discussion problems were followed by discussions of the procedures used for organizing and videotaping the sessions, and for recording interaction. The chapter concluded with a description of instrument development, and a listing of the hypotheses tested and the statistical tests employed for that purpose.





## CHAPTER IV

### DATA ANALYSIS AND RESULTS - INTERACTION PATTERNS

The purpose of this study was to determine the nature of relationships which existed between the decision-rules under which problem-solving groups operated and variables associated with both interaction patterns and certain outcomes of the groups' discussions. Chapter IV presents results obtained from the analysis of interaction data. The results of the analysis of data related to outcomes are presented in Chapter V.

Interaction data were obtained by recording each unit of verbal communication in one of thirty categories of interaction. The interaction categories, developed from those suggested by Bales (1950), indicated both the content and the source and direction of the communication. Nineteen specific questions were posed in an attempt to determine relationships between decision-rules and interaction patterns. The hypotheses that arose from these 19 questions were presented in Chapter III.

A total of 44 non-directional hypotheses were tested. Included were hypotheses tested to determine associations between the three treatments and the total amount of communication, the amount of communication initiated by the leaders, the amount of communication initiated by individuals, the amount of communication in each of the five attribution (source and direction) categories, the amount of communication in each of the six content categories, and the



amount of communication in each of the thirty categories formed when the attribution and content categories were combined. All hypotheses were tested using the Friedman two-way analysis of variance by ranks, followed by the Wilcoxon matched-pairs signed-ranks test, which compared the treatments in pairs. The .05 level of significance was selected for use with the tests. The number of observations in each case was six.

Three factors combined to create a situation in which differences among treatments had to be large in order to be statistically significant. First, non-directional hypotheses were used. Second, the number of observations in most cases was small. Finally, non-parametric tests were used in order to avoid certain assumptions associated with parametric tests. In order to draw attention to apparent trends in the data not indicated by significant differences, some references are made in this chapter and in Chapter V to relatively large differences in the raw data which were not found to be statistically significant.

### Total Interaction

Three hypotheses, I.1, I.2, and I.3 were tested to determine relationships between the decision-rule employed and three broad categories of interaction: total communication from members, total communication from leaders, and total communication from individuals.



### *Hypothesis I.1*

The first hypothesis was that no significant differences exist in the mean ranks of the total number of communications initiated by group members when the groups operate under the centralist, the majority, and the consensus arrangements.

The results of the analysis carried out in connection with hypothesis I.1 are included in the lower right section of Table VI, which gives for each category of interaction the mean number of communications ( $\bar{X}$ ) under each treatment, the sum of ranks ( $\Sigma r$ ) under each treatment, the Friedman statistic ( $\chi_r^2$ ), and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance. Where calculations involved tied ranks exact probability could not be determined from the tables. In those cases the probability was reported as falling between two values given in the table. This same procedure was used in other tables found in Chapters IV and V.

With a sample size of six the value of the Friedman statistic had to exceed 6.33 if the null hypothesis was to be rejected at the .05 level of confidence. Since the value of  $\chi_r^2$  in this case was 5.083, the null hypothesis that no significant differences exist in the mean ranks of the total number of communications under the three treatments was not rejected.

The mean numbers of communications under the centralist, the majority, and the consensus arrangements were 317.5, 401.3, and 524.0, respectively. The trend was for the total number of communications to increase as the treatments changed from centralist, through majority,





TABLE VI  
INTERACTION CATEGORIES UNDER THREE DECISION-RULES - MEANS,  
SUMS OF RANKS AND FRIEDMAN STATISTIC PROBABILITIES

	POSITIVE REACTION			GIVES ADVICE			GIVES INFORMATION			ASKS INFORMATION			ASKS ADVICE			NEGATIVE REACTION			TOTAL		
	Cent.	Maj.	Cons.	Cent.	Maj.	Cons.	Cent.	Maj.	Cons.	Cent.	Maj.	Cons.	Cent.	Maj.	Cons.	Cent.	Maj.	Cons.	Cent.	Maj.	Cons.
Leader to Group	$\bar{X}$ 12.5 $\chi^2$ 0.583	1.5 10.5 .740	2.0 13.0 <p<.956	23.2 11.0 1.000	22.5 11.0 P = .740	37.5 14.0 P = .740	19.2 10.5 2.250	20.2 10.5 .430	26.0 15.0 <p<.570	0.0 10.0 1.750	1.0 14.5 .430	1.0 11.5 <p<.570	3.3 7.0 7.000	10.3 13.0 P = .029	13.5 16.0 P = .029				47.2 9.0 3.000	55.5 12.0 P = .252	80.2 15.0 P = .252
Leader to Individual	$\bar{X}$ 9.5 $\chi^2$ 1.750	12.5 12.5 .430	16.0 14.0 <p<.570	14.5 12.0 0.333	15.7 13.0 P = .956	17.0 11.0 P = .956	13.7 12.0 0.083	13.8 11.5 .956	14.3 12.5 <p<.000	0.3 7.5 5.083	3.3 14.5 .072	3.0 14.0 <p<.142	8.2 11.5 0.083	8.0 12.0 .956	9.5 12.5 <p<.000				44.0 11.0 1.000	55.3 14.0 P = .740	60.2 11.0 P = .740
Individual to Group	$\bar{X}$ 11.0 $\chi^2$ 1.000	0.5 11.0 P = .740	1.7 14.0 P = .740	36.5 8.0 7.000	83.3 11.0 P = .029	120.8 17.0 P = .029	12.3 7.0 7.000	20.8 13.0 P = .029	26.7 16.0 P = .029	0.7 11.5 0.083	0.8 12.5 .956	0.7 12.0 <p<.000	3.5 9.0 3.000	4.7 12.0 P = .252	8.3 15.0 P = .252				53.2 7.0 8.333	110.2 12.0 P = .012	158.2 17.0 P = .012
Individual to Leader	$\bar{X}$ 11.5 $\chi^2$ 4.750	1.5 8.5 .072	6.2 16.0 <p<.142	70.0 13.0 1.000	70.3 13.0 P = .740	60.2 10.0 P = .740	20.8 12.5 0.250	19.0 12.5 .956	19.2 11.0 <p<.000	4.0 11.0 0.250	4.3 12.5 .956	5.3 12.5 <p<.000	4.8 11.5 0.083	4.5 12.5 .956	8.0 12.0 <p<.000				102.3 12.5 0.583	100.5 13.0 .740	99.8 10.5 <p<.956
Individual to Individual	$\bar{X}$ 7.0 $\chi^2$ 6.333	12.5 14.0 P = .052	17.5 15.0 P = .052	34.0 12.0 3.000	30.7 9.0 P = .252	61.3 15.0 P = .252	15.0 11.5 2.583	19.3 9.5 .252	23.7 15.0 <p<.430	1.8 9.5 4.083	8.2 10.5 .142	7.5 16.0 <p<.184	7.7 12.0 2.083	6.5 9.5 .252	12.2 14.5 <p<.430				70.8 11.5 4.750	79.8 8.5 .072	125.7 16.0 <p<.142
TOTAL	$\bar{X}$ 20.0 $\chi^2$ 7.000	28.5 11.0 P = .029	43.3 17.0 P = .029	178.2 8.0 5.333	222.5 12.0 P = .072	296.8 16.0 P = .072	81.0 11.0 2.333	93.2 10.0 P = .430	109.8 15.0 P = .430	6.8 8.5 4.750	17.7 11.5 .072	17.5 16.0 <p<.142	27.5 10.0 2.333	34.0 11.0 P = .430	51.5 15.0 P = .430				317.5 9.5 5.083	401.3 10.0 .072	524.0 16.5 <p<.142





to consensus. The mean number of communications under the centralist arrangement was approximately 61 per cent of the mean number under the consensus arrangement.

### *Hypothesis I.2*

Hypothesis I.2 was that no significant differences exist in the mean ranks of the total number of communications initiated by the leader when the groups operate under the centralist, the majority, and the consensus arrangements.

Table VII contains the mean number of communications from the leader and the sums of the ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE VII  
MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR TOTAL COMMUNICATION FROM LEADER UNDER THREE  
DECISION-RULES

	Centralist	Majority	Consensus
Means	91.2	110.8	140.3
Sums of Ranks	8.0	13.0	15.0
Friedman Statistic	4.333	Probability	.142

Because the value of the Friedman statistic did not exceed 6.33 the null hypothesis that there are no significant differences in the mean ranks of the number of communications from the leader was not



rejected. The mean numbers of communications from the leader under the centralist, the majority, and the consensus arrangements were 91.2, 110.8, and 140.3. The trend was for the number of communications from the leaders to increase as the treatments changed from centralist, through majority, to consensus. The mean number of communications from the leader under the centralist arrangement was approximately 65 per cent of the mean number under the consensus arrangement.

### *Hypothesis I.3*

Hypothesis I.3 was that no significant differences exist in the mean ranks of the total number of communications initiated by individuals when the groups operate under the centralist, the majority, and the consensus arrangements.

Table VIII shows the mean number of communications from individuals and the sum of the ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE VIII  
MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR TOTAL COMMUNICATION FROM INDIVIDUALS UNDER THREE  
DECISION-RULES

	Centralist	Majority	Consensus
Means	226.3	290.5	383.7
Sums of Ranks	9.0	11.0	16.0
Friedman Statistic	4.333	Probability	.142



Because the value of the Friedman statistic did not exceed 6.33 the null hypothesis that there are no significant differences in the mean ranks of the number of communications from individuals was not rejected. The mean numbers of communications from individuals under the centralist, the majority, and the consensus arrangements were 226.3, 290.5, and 383.7, respectively. Once again the trend was for the number of communications from individuals to increase as the treatments changed from centralist, through majority, to consensus. The mean number of communications from individuals under the centralist arrangement was approximately 59 per cent of the mean number under the consensus arrangement.

In summary, the Friedman test indicated no significant differences among the three treatments when the broad categories, total communication, communication from the leader, and communication from individuals, were considered. However, the data used to test the three hypotheses indicated a consistent trend toward increasing amounts of communication being initiated as the treatments changed from centralist, through majority, to consensus, with the mean number of communications under the centralist arrangement being about 60 per cent of the mean number under the consensus arrangement.

A further observation can be made from the data in Tables VII and VIII. If the mean number of communications from individuals under each treatment (Table VIII) is divided by four, and the resulting means for individuals are compared to the means for leaders (Table VII), it can be shown that under each treatment the average leader initiated





approximately 50 per cent more communication than did the average individual. Reference was made in Chapter II to the tendency on the part of those designated to act as leaders to initiate more communication.

#### Source and Direction of Communications

##### *Hypotheses I.4, I.5, I.6, I.7, I.8*

Hypotheses I.4 to I.8 inclusive were tested to determine relationships between the decision-rule under which the groups operated and the source and direction of communications (attribution) within the group. In general terms the five hypotheses stated that no significant differences exist in the number of communications from a particular source to a particular target when the groups operate under the centralist, the majority, and the consensus arrangements. Hypotheses I.4 and I.5 involved communications from the leader to the group and from the leader to an individual, respectively. Hypotheses I.6, I.7, and I.8 involved communications from an individual to the group, to the leader, and to another individual, respectively.

The data used to test the five hypotheses were obtained by totalling horizontally the number of communications recorded in each of the six content categories within each of the five rows of the interaction coding form. The mean number of communications ( $\bar{X}$ ) and the sum of ranks ( $\Sigma r$ ) under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by



chance are given for each category of attribution in the extreme right column of Table VI under the heading, "Total."

Since the number of observations was six in each case, the null hypothesis was rejected if the value of the Friedman statistic ( $\chi_r^2$ ) exceeded 6.33. On this basis four of the five hypotheses in this section could not be rejected. In the case of hypothesis I.6 the analysis produced a Friedman statistic of 8.333; and therefore the null hypothesis, that no significant differences exist in the mean ranks of the total number of communications from individuals to the group when the groups operate under the centralist, the majority, and the consensus arrangements, was rejected.

For communications from individuals to the group the sums of ranks for the centralist, the majority, and the consensus arrangements were 7.0, 12.0, and 17.0, respectively, and the mean number of communications were 53.2, 110.2, and 158.2, respectively. When the samples under the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the numbers of communications under the centralist and consensus treatments were found to differ significantly. These findings suggested that non-leader members of the group addressed their communications more to the group as a whole when the group was operating under the consensus arrangement than when it was operating under the centralist arrangement.

In two of the four categories of attribution in which no significant differences between treatments were found there were considerable differences between the mean numbers of communications under the



centralist and consensus arrangements. In the "leader to group" and "individual to individual" categories the mean numbers of communications under the centralist arrangement were approximately 59 per cent and 56 per cent, respectively, of the mean numbers under the consensus arrangement.

In the "leader to individual" and "individual to leader" categories, on the other hand, the differences were not nearly so marked. The trends indicated were (a) that leaders addressed more communications to the group, and individuals addressed more communications to other individuals as the treatment changed from centralist to consensus, and (b) that communications from leaders to individuals and from individuals to leaders did not increase to any marked degree as the treatment changed from centralist to consensus.

### Content

#### *Hypotheses I.9, I.10, I.11, I.12, I.13, I.14*

Hypotheses I.9 to I.14 inclusive were tested to determine relationships between the decision-rule under which the groups operated and the content of communications. In general terms the six hypotheses stated that no significant differences exist in the mean ranks of the total number of communications recorded in a particular category of content when the groups operate under the centralist, the majority, and the consensus arrangements. The six content categories associated with the six hypotheses were "positive reaction", "gives advice", "gives information", "asks information",





"asks advice," and "negative reaction," respectively.

The data used to test the six hypotheses were obtained by totalling vertically the number of communications recorded in each of the five attribution categories within each of the six columns of the interaction recording form. The mean number of communications ( $\bar{X}$ ) and the sum of ranks ( $\Sigma r$ ) under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance are given for each category of content in the bottom row of Table VI to the right of the heading "Total."

Since the number of observations was six in each case, the null hypothesis was rejected if the value of the Friedman statistic exceeded 6.33. Of the six hypotheses five could not be rejected. In the case of hypothesis I.9 the analysis produced a Friedman statistic of 7.000; and therefore the null hypothesis, that no significant differences exist in the mean ranks of the total number of communications recorded in the "positive reaction" category when the groups operate under the centralist, the majority, and the consensus arrangements, was rejected.

For the "positive reaction" category the sums of ranks for the centralist, the majority, and the consensus arrangements were 8.0, 11.0, and 17.0, respectively, and the mean numbers of communications were 20.0, 28.5, and 43.3, respectively. When the samples under the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the numbers of communications under the centralist and the consensus treatments were found to differ significantly. These





findings suggested that group members gave more positive reactions to other members' statements when the group was operating under the consensus arrangement than when it was operating under the centralist arrangement.

In three of the five content categories in which no significant differences between treatments were found the number of communications under the centralist arrangement was considerably less than the number under the consensus arrangement. In the "gives advice" and "asks advice" categories the mean numbers of communications under the centralist arrangement were approximately 60 per cent and 53 per cent, respectively, of the mean numbers under the consensus arrangement. In the "asks information" category the mean number of communications under the centralist arrangement was approximately 38 and 39 per cent, respectively, of the mean numbers under the majority and consensus arrangements.

These data suggested that group members under the consensus arrangement, in addition to giving more positive reactions, may have given more suggestions and opinions, may have asked for more suggestions and opinions, and may have asked for more information than under the centralist arrangement. There appeared to be no marked differences in either the amount of information given or the number of negative reactions given under the three treatments.



### Content and Attribution Combined

The basic data for the analyses described in the previous sections of this chapter were obtained by combining all or some of the original 30 categories used to code interaction. In this section the data from each of the 30 categories will be examined separately. Data from six categories were used to test each of the five general hypotheses.

#### *Hypothesis I.15*

Hypothesis I.15 was that no significant differences exist in the mean ranks of the number of communications from the leader to the group within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements.

The mean number of communications ( $\bar{X}$ ) and the sum of ranks ( $\Sigma r$ ) under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance are given for each category in the top row of Table VI. The data for the "negative reaction" category were excluded because the number of communications under each treatment in that category was too small to permit a meaningful analysis.

Since the number of observations was six in each case, the null hypothesis for each category was rejected if the value of the Friedman statistic exceeded 6.33. Using this criterion the null hypothesis was rejected in one of the five categories tested. In the case of



the hypothesis tested in connection with the "asks advice" category the analysis produced a Friedman statistic of 7.000; and therefore the null hypothesis that no significant differences exist in the mean ranks of the number of communications from the leader to the group within the "asks advice" category when the groups operate under the centralist, the majority, and the consensus arrangements, was rejected.

For the "asks advice" category the sums of ranks for the centralist, the majority, and the consensus arrangements were 7.0, 13.0, and 16.0, respectively, and the mean numbers of communications were 3.3, 10.3, and 13.3, respectively. When the samples under the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the numbers of communications under the centralist and the consensus treatments were found to differ significantly. These findings suggested that the person designated as leader for the group asked for more opinion or suggestion from the group as a whole when the group was operating under the consensus arrangement than when it was operating under the centralist arrangement.

Marked differences in means occurred in only one of the other four categories analyzed. In the "gives advice" category the means under the centralist and majority treatments were 62 per cent and 60 per cent, respectively, of the mean under the consensus arrangement. These differences suggested that the leader, in addition to asking for more suggestions and opinion from the group under the consensus arrangement, tended to give more suggestions and





opinions to the group under that arrangement than under the centralist arrangement.

### *Hypothesis I.16*

Hypothesis I.16 was that no significant differences exist in the mean ranks of the number of communications from the leader to an individual within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements.

The mean number of communications ( $\bar{X}$ ) under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance are given for each category in the second row of Table VI. The data for the "negative reaction" category were excluded because the number of communications under each treatment in that category was too small to permit a meaningful analysis.

Since in each case the number of observations was six, the null hypothesis for each category was rejected if the value of the Friedman statistics exceeded 6.33. Using this criterion the null hypotheses could not be rejected for any of the five categories tested. These findings indicated that no statistically significant association existed between the decision-rule under which groups operated and the number of communications from the leader to some other group member, be these communications positive reactions, giving advice or information, or asking advice or information.

Large differences in means occurred in only one of the five categories analyzed. In the "positive reaction" category the mean number of communications under the centralist arrangement was approximately 46 per cent of the mean number under the consensus arrangement. This



difference indicated that the leader tended to give more positive reactions to individuals under the consensus arrangement than under the centralist arrangement.

### *Hypothesis I.17*

Hypothesis I.17 was that no significant differences exist in the mean ranks of the number of communications from individuals to the group within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements.

The mean number of communications ( $\bar{X}$ ) and the sum of ranks ( $\sum r$ ) under each treatment, the Friedman statistic, and the probability of a  $\chi^2_r$  value of that magnitude occurring by chance are given for each category in the third row of Table VI. The data for the "negative reaction" category were excluded because the number of communications under each treatment in that category was too small to permit a meaningful analysis.

Since the number of observations was six in each case, the null hypothesis for each category was rejected if the value of the Friedman statistic exceeded 6.33. Using this criterion the null hypothesis was rejected in two of the five categories tested. The two hypotheses rejected were those tested in connection with the "gives advice" and "give information" categories.

In the case of the "gives advice" category the analysis produced a Friedman statistic of 7.000. The sums of ranks for the centralist, the majority, and the consensus arrangements were 8.0, 11.0, and 17.0, respectively, and the mean numbers of communications were 36.5, 83.3, and 120.8, respectively. When the samples under



the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the numbers of communications under the centralist and the consensus treatments were found to differ significantly.

For the "gives information" category the analysis again produced a Friedman statistic of 7.000. The sums of ranks for the centralist, the majority, and the consensus arrangements were 7.0, 13.0 and 16.0 respectively, and the mean numbers of communications were 12.3, 20.8, and 26.7, respectively. When the samples under the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the numbers of communications under the centralist and the consensus treatments were found to differ significantly.

These two findings suggested that the individuals gave more suggestions and opinions and more information to the group as a whole when the group was operating under the consensus arrangement than when it was operating under the centralist arrangement.

With the possible exception of the "asks advice" category, the means within the other three categories analyzed were not markedly different. In the "asks advice" category the mean number of communications under the centralist arrangement was approximately 42 per cent of the mean number under the consensus arrangement. However, because the mean numbers are quite small, a suggestion of a trend in the data might be misleading.

### *Hypothesis I.18*

Hypothesis I.18 was that no significant differences exist in the mean ranks of the number of communications from individuals to





the leader within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements.

The mean number of communications ( $\bar{X}$ ) and the sum of ranks ( $\Sigma r$ ) under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance are given for each category in the fourth row of Table VI. The data for the "negative reaction" category were excluded because the number of communications under each treatment in that category was too small to permit a meaningful analysis.

Since in each case the number of observations was six, the null hypothesis for each category was rejected if the value of the Friedman statistic exceeded 6.33. Using this criterion the null hypotheses could not be rejected for any of the five categories tested. These findings indicated that no statistically significant association existed between the decision-rule under which groups operated and the number of communications from individuals to the leader, be these communications positive reactions, giving advice or information, or asking advice or information.

Within two of the five categories analyzed the differences in means were large enough to suggest possible trends. In the "positive reaction" category the mean numbers of communications under the centralist and majority arrangements were, respectively, approximately 37 per cent and 24 per cent of the mean number under the consensus arrangement. In the "asks advice" category the mean numbers of





communications under the centralist and majority arrangements were, respectively, approximately 60 per cent and 56 per cent of the mean number under the consensus arrangement.

These differences indicated that individuals tended to give the leader more positive reactions and to ask more suggestions and opinions from him under the consensus arrangement than under either of the other two arrangements. Again, the mean numbers of communications involved in both instances were small. As a result the trends suggested by them may be misleading.

#### *Hypothesis I.19*

Hypothesis I.19 was that no significant differences exist in the mean ranks of the number of communications from individuals to other individuals within each of the six content categories when the groups operate under the centralist, the majority, and the consensus arrangements. The mean number of communications ( $\bar{X}$ ) and the sum of the ranks ( $\Sigma r$ ) under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance are given for each category in the fifth row of Table VI.

Since in each case the number of observations was six, the null hypothesis for each category was rejected if the value of the Friedman statistic exceeded 6.33. Using this criterion the null hypotheses could not be rejected for any of the six categories tested. These findings indicated that no statistically significant association existed



between the decision-rule under which groups operated and the number of communications from individuals to other individuals, be these communications positive reactions, giving advice or information, or asking advice or information.

While no significant differences were found among the numbers of communications from individuals to other individuals under the three treatments, the differences between means in five of the six categories were sufficiently large to suggest possible trends. In the "positive reaction" category the mean number of communications under the centralist arrangement was approximately 50 per cent of the mean number under the consensus arrangement. In the "gives advice" category the mean numbers of communications under the centralist and majority arrangements were, respectively, approximately 55 per cent and 50 per cent of the mean number under the consensus arrangement. In the "gives information" category the mean number of communications under the centralist arrangement was approximately 63 per cent of the mean number under the consensus arrangement.

In the "asks information" category the mean number of communications under the centralist arrangement was approximately 22 per cent of the mean number under the majority arrangement and 24 per cent of the mean number under the consensus arrangement. In this category, because the numbers involved were small, the proportions might be misleading. Finally, in the "asks advice" category the mean numbers of communications under the centralist and majority arrangements were, respectively, approximately 63 per cent and 53 per cent of the



mean number under the consensus arrangement.

The trend indicated by these differences in means was consistent. Under the consensus arrangement individuals gave more positive reactions, more suggestions and opinion, and more information to other individuals, and asked for more information, and more opinions and suggestions from other individuals than they did under the centralist arrangement.

### Additional Analyses

The results of two additional analyses carried out in connection with interaction patterns are reported in this section. The first results reported are those obtained by comparing in pairs the samples under the three treatments for all categories using the Wilcoxon matched-pairs signed-ranks test. The second results reported were obtained by repeating all the tests of hypotheses using percentage scores rather than raw scores.

#### *Wilcoxon Tests*

To test the hypotheses developed in connection with interaction patterns the Friedman test was used to indicate whether there was an over-all difference among the samples from the three treatments. In those cases where the null hypothesis was rejected the Friedman test was followed by the Wilcoxon procedure to test for differences between any two of the three samples.

The use of a procedure to test for significant differences between any two of the samples is justifiable if it is used, as it





was above, after a k-sample test has produced a rejection of the null hypothesis. In fact, however, when the analyses were carried out the Wilcoxon tests were applied to all samples whether or not the Friedman test had produced a rejection of the null hypothesis. The results of all the Wilcoxon matched-pairs signed-ranks test are presented here because they indicated trends in the data, a knowledge of which could be useful to other researchers. However, because comparing the samples two at a time capitalizes on chance and may lead to fallacious conclusions (Siegel, 1956, p. 159) no discussion of the results follows their presentation.

With the exceptions of "total communication from the leader," and "total communication from individuals," all categories to which the Wilcoxon tests were applied are included in Table IX. In the "total communication from the leader" category the numbers of communications under the centralist and consensus treatments were found to be significantly different, with the numbers under the consensus treatment having the largest mean. In the "total communication from individuals" category no significant differences among treatments were found.

Significant differences between numbers of communications in all other categories are indicated by the use of asterisks in Table IX. The asterisk in the "individual-to-group positive-reaction" category, for example, indicates significant differences in the numbers of communications under the centralist and consensus treatments but no significant differences in the numbers of communications under



TABLE IX

WILCOXON MATCHED-PAIRS SIGNED-RANKS TESTS  
FOR SAMPLES UNDER THREE TREATMENTS

		POSITIVE REACTION		GIVES ADVICE		GIVES INFORMATION		ASKS INFORMATION		ASKS ADVICE		NEGATIVE REACTION		TOTAL	
		Cent.	Maj. Cons.	Cent.	Maj. Cons.	Cent.	Maj. Cons.	Cent.	Maj. Cons.	Cent.	Maj. Cons.	Cent.	Maj. Cons.	Cent.	Maj. Cons.
Leader to Group	Cent. Maj. Cons.	-	-	-	-	-	-	-	-	-	*	-	-	-	*
Leader to Individual	Cent. Maj. Cons.	-	-	-	-	-	-	*	*	-	-	-	-	-	-
Individual to Group	Cent. Maj. Cons.	-	*	-	*	-	-	-	-	-	-	-	-	-	*
Individual to Leader	Cent. Maj. Cons.	*	-	-	-	-	-	-	-	-	-	-	-	-	-
Individual to Individual	Cent. Maj. Cons.	*	-	-	-	-	-	*	*	-	-	-	-	-	-
Total	Cent. Maj. Cons.	-	*	-	*	-	-	-	-	-	-	-	-	-	*

<sup>a</sup> Asterisk indicates samples are from different populations.



either the centralist and majority treatments or the majority and consensus treatments. The five blank sections in the table indicate that the numbers of acts recorded in these categories were not large enough to permit a meaningful analysis.

Table IX does not indicate the direction of the differences between samples. However, with one exception, where significant differences were found the mean numbers of communications in the consensus and majority samples were larger than in the centralist samples. The exception was the "individual-to-leader positive-reaction" category. In that case the mean number of communications for the majority sample was less than the mean number for the centralist sample.

#### *Percentage of Total Interaction under each Treatment*

The analyses that produced the results reported in this section were carried out because the possibility existed that changes in interaction patterns might be indicated more clearly if the total interaction under each treatment were constant. While the test of hypothesis I.1 indicated that the differences in total interaction under the three treatments could have occurred by chance, the differences were, nevertheless, large enough to cause speculation that differences in the number of communications recorded under each treatment in a particular category might have arisen partly because the groups generally talked more under the majority and consensus treatments than they did under the centralist treatment.





Data on the total interaction by each of the six groups under the three treatments are given in Table X. In every case the number of communication acts recorded under the consensus arrangement was equal to or greater than the number recorded under the centralist arrangement. In total, the number of acts under the consensus arrangement was 1.65 times the number under the centralist arrangement.

The situation in which the total interaction under each treatment is constant can be produced mathematically by assigning a total interaction of 100 to each of the treatments and adjusting the numbers in all sub-categories proportionately. In other words, the number of communication acts for each treatment in each category is expressed as a percentage of the total number of communication acts under the treatment. This procedure is based on the assumption that the proportion of interaction recorded in each category for each treatment remains constant regardless of the total amount of interaction under that treatment.

TABLE X  
TOTAL COMMUNICATION BY GROUPS UNDER THREE TREATMENTS

Group	Centralist	Majority	Consensus
A	243	186	732
B	423	419	662
C	528	704	743
D	270	614	270
E	158	213	342
F	283	272	395





All hypotheses except number I.1 (total communication) were tested again by the Friedman procedure using percentage scores rather than raw scores. In those cases in which the Friedman statistic indicated significant differences the treatments were compared in pairs, as before, using the Wilcoxon matched-pairs signed-ranks test.

The Friedman tests, with three exceptions, indicated no significant differences in percentages of communication among the three treatments. The data from the three exceptions are reported below.

Table XI contains the mean per cent of total interaction from individuals to the group and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi^2_r$  value of that magnitude occurring by chance.

TABLE XI  
MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR PER CENT OF TOTAL INTERACTION INDIVIDUAL TO GROUP  
UNDER THREE DECISION-RULES

	Centralist	Majority	Consensus
Means	16.9	28.2	30.3
Sums of Ranks	7.0	13.0	16.0
Friedman Statistic	7.000	Probability	.029



The sums of ranks for the centralist, the majority and the consensus arrangements were 7.0, 13.0 and 16.0, respectively, and the mean percentages of total interaction were 16.9, 28.2, and 30.3 respectively. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the percentages of communication under the consensus and centralist treatments were found to differ significantly. These findings were very similar to those obtained when the tests were carried out on hypothesis I.6 using raw data. They suggested that non-leader members of the group tended to address a greater proportion of their communications to the group as a whole when the group was operating under the consensus arrangement than when it was operating under the centralist arrangement.

Table XII contains the mean per cent of total interaction from individuals to the group in the "gives advice" category under each treatment, the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XII

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR PER CENT OF TOTAL INTERACTION INDIVIDUAL TO GROUP  
GIVES ADVICE UNDER THREE DECISION-RULES

	Centralist	Majority	Consensus
Means	11.8	22.2	23.5
Sums of Ranks	6.0	14.0	16.0
Friedman Statistic	9.333	Probability	.006



The sums of ranks for the centralist, the majority, and the consensus arrangements were 6.0, 14.0, and 16.0, respectively, and the mean percentages of interaction were 11.8, 22.2, and 23.5, respectively. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the percentages of communication under the centralist and the majority treatments and under the centralist and the consensus treatments were found to be significantly different. Tests run in connection with hypothesis I.17 using raw data indicated only that the number of communications under the centralist and consensus arrangements were significantly different. In this category using percentage scores rather than raw scores seems to have accentuated the differences between treatments. The findings when percentage data were used suggested that non-leader members of the group gave a greater proportion of suggestions and opinions to the group as a whole when the group was operating under either the majority or the consensus arrangements than when it was operating under the centralist arrangement.

Table XIII contains the mean per cent of total interaction from the leader to individuals in the "asks information" category under each treatment, the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.





TABLE XIII

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR PER CENT OF TOTAL INTERACTION LEADER TO INDIVIDUAL  
ASKS INFORMATION UNDER THREE DECISION-RULES

	Centralist	Majority	Consensus
Means	0.1	0.7	0.6
Sums of Ranks	7.0	15.5	13.5
Friedman Statistic	6.583	Probability	.029 < P < .052

The sums of ranks for the centralist, the majority, and the consensus arrangements were 7.0, 15.5, and 13.5, respectively, and the mean percentages of interaction were 0.1, 0.7, and 0.6, respectively. Because the mean percentages were so small any conclusions drawn from the data must be accepted with reservations. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the percentages of communications under the centralist and majority treatments, and under the centralist and consensus treatments were found to be significantly different. Tests run in connection with hypothesis I.16 using raw data indicated no significant differences. The findings suggested that a greater proportion of the leaders' communications to individuals was in the "asks information" category when the group was operating under either the majority or the consensus arrangements than when it is operating under the centralist arrangement.



## Chapter Summary

Chapter IV contains the results of analyses carried out to determine the nature of relationships between the decision-rule employed by a problem-solving group and patterns of interaction.

### *Significant Differences*

The data from the thirty interaction categories were tested separately and in a number of combinations in an attempt to demonstrate differences in interaction patterns under the three decision-rules. Because the number of observations was six in each case, differences in the numbers of communications under the three treatments had to be large if they were to be significant. With one exception, in all cases where significant differences were found they occurred between the centralist and consensus treatments. In one case the centralist sample differed significantly from the majority sample as well as the consensus sample.

Tests of the attribution categories indicated that non-leader members addressed more communications and a greater proportion of their communications to the group as a whole when the group was operating under the consensus arrangement than when it was operating under the centralist arrangement. When the "individual-to-group" data were analyzed according to content as well as attribution, the tests revealed that, in particular, individuals addressed more information, more suggestions and opinions, and a greater proportion of suggestions and opinions to the group under the consensus



arrangement than under the centralist arrangement.

Tests of the content categories indicated that group members gave more positive reactions to the statements of other group members when the group was operating under the consensus arrangement than when it was operating under the centralist arrangement.

Finally, tests carried out on the categories formed when the attribution and content categories were combined indicated that the member designated as leader asked for more opinions and suggestions from the group under the consensus arrangement than under the centralist arrangement. There was also an indication that a greater proportion of the leaders' communications to individuals was in the "asks information" category under either the consensus or majority arrangements than under the centralist arrangement. However, because of the very small mean percentages involved this last finding should be accepted with caution.

### *Trends*

The use of non-directional hypotheses, small samples, and non-parametric statistics created a situation in which differences among treatments had to be large to be statistically significant. As a result attention was drawn in this chapter to possible trends in the data indicated by relatively large, but not statistically significant, differences in means.

When the three broad categories, total communication, communication from leaders, and communication from individuals, were considered, the data indicated a consistent trend toward increasing amounts of communication being initiated as the treatments changed from centralist,





through majority, to consensus. This trend was maintained, for the most part, as the data were divided by more specific categories.

In the attribution categories the trends indicated that, in addition to individuals addressing their communications more to the group as a whole (significant difference), leaders addressed more communications to the group, and individuals addressed more communications to other individuals as the treatment changed from centralist to consensus. Interaction between leaders and individuals did not show this same trend.

In the content categories data trends suggested that group members under the consensus arrangement, in addition to giving more positive reactions (significant difference), gave more suggestions and opinions, asked for more suggestions and opinions, and asked for more information than under the centralist arrangement. There appeared to be no marked differences in either the amount of information given or the number of negative reactions given under the three treatments.

When the content and attribution categories were analyzed in combination the following trends were indicated:

(a) The leader, in addition to asking for more suggestions and opinions from the group (significant difference) under the consensus arrangement, tended to give more suggestions and opinions to the group under that arrangement than under the centralist arrangement.

(b) The leader tended to give more positive reactions to individuals under the consensus arrangement than under the centralist arrangement.





(c) Individuals under the consensus arrangement, in addition to giving more suggestions and opinions, and more information to the group (significant differences), may also have tended to ask for more opinions and suggestions from the group than they did under the centralist arrangement. However, the numbers involved in this latter category were small.

(d) Individuals may have tended to give the leader more positive reactions and to ask more suggestions and opinions of him under the consensus arrangement than under either of the other two arrangements. Again, the numbers involved were small.

(e) Individuals tended to give more positive reactions, more suggestions and opinions, and more information to other individuals, and to ask for more information, and for more opinions and suggestions from other individuals under the consensus arrangement than under the centralist arrangement.



## CHAPTER V

### DATA ANALYSIS AND RESULTS - OUTCOMES

The previous chapter was devoted to reporting the results of analyses carried out to determine the nature of relationships which existed between the decision-rule employed by a problem-solving group and the patterns of interaction within the group. Chapter V presents the results of analyses designed to explore relationships between the decision-rule used and (a) the time required to reach a decision, (b) the satisfaction of group members with the process, and (c) the commitment of group members to the decision reached. The data used in these analyses were obtained by timing the discussion sessions, and by administering instruments designed to test satisfaction with process and commitment to decision.

A total of 16 tests of hypotheses and sub-hypotheses were carried out. All hypotheses were tested using the Friedman two-way analysis of variance by ranks, followed by the Wilcoxon matched-pairs signed-ranks test, which compared the treatments in pairs. The .05 level of significance was selected for use with the tests. In this chapter, as in the previous chapter, in those cases where the number of observations was only six, some references are made to differences in means which were not found to be statistically significant, but which appeared to indicate trends.



### Decision-time

The data used to determine possible relationships between decision-rules and the time required to reach a decision were obtained by recording the number of minutes between the time when the signal was given for the discussion to begin and the time when the final decision was reached.

#### *Hypothesis II*

Hypothesis II was that no significant differences exist in the mean ranks of the number of minutes required to reach a decision when the groups operate under the centralist, the majority, and the consensus arrangements.

Table XIV contains the mean number of minutes and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

Because the probability that the  $\chi_r^2$  value of 4.333 as computed could occur by chance was greater than .05 the null hypothesis that no differences exist in the mean times to reach decisions under the three treatments could not be rejected.

However, the trend in the data was similar to that noted in connection with the analysis of total interaction. The number of minutes required to reach a decision increased as the treatments changed from centralist, through majority, to consensus. The mean number of minutes required to reach a decision under the centralist





arrangement was 62 per cent of the mean number required under consensus. The total number of communication units under the centralist arrangement was 61 per cent of the total number under consensus. The similarity of these proportions suggested a standard interaction rate under these two treatments.

TABLE XIV

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC  
PROBABILITY FOR DECISION-TIME IN MINUTES  
UNDER THREE DECISION-RULES

	Centralist	Majority	Consensus
Means	23.0	31.2	37.0
Sums of Ranks	9.0	11.0	16.0
Friedman Statistic	4.333	Probability	.142

#### Satisfaction with Process

The data used to determine relationships between the decision-rule employed and satisfaction with the process by which the decision was reached were obtained by administering the process instrument to all subjects immediately following their decision-making under each of the three treatments. Because there was some evidence that the individual selected as leader might react differently to the instrument than the other members of the group (Chapter II) the data were arranged to form three different groupings. First, the data from all subjects were considered as a unit. Next, the same data



were split into two parts with the leaders' responses being analyzed separately from the responses of other individuals in the groups. The data from these three groupings were used to test hypotheses III.1, III.2, and III.3.

Factor analyses of the data obtained from the process instrument provided evidence that the instrument had, in fact, tested three domains. As a result of these analyses two of the original fifteen items were eliminated from the instrument and the remaining thirteen items were combined to form three sub-scales, which were entitled "performance facilitation," "task achievement," and "discussion adequacy" (Chapter III). The creation of these three sub-scales made it necessary to test nine sub-hypotheses in addition to the three major hypotheses, since the data from each of the sub-scales were further divided according to the three groupings described in the previous paragraph.

#### *Hypothesis III.1*

Hypothesis III.1 was that no significant differences exist in the mean ranks of the group members' scores on the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for each member were obtained by totalling his responses to the 13 items of the process scale. The scores for all 30 subjects were considered under each treatment. In all instances in which responses to the process and decision instruments were totalled, the totals were taken after responses to the items had been adjusted



in such a way that high satisfaction or commitment was always indicated by a high number on the six-point scale. Approximately one-half of the items of each scale had been written in such a way that low agreement with the item indicated high satisfaction or commitment. The responses to these items were assigned the corresponding value on the opposite side of the six-point scale.

Table XV contains the mean scores on the process instrument and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XV

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR GROUP MEMBERS' SATISFACTION WITH PROCESS  
UNDER THREE DECISION-RULES

(N = 30)

	Centralist	Majority	Consensus
Means	56.6	60.9	62.8
Sums of Ranks	46.5	58.5	75.0
Friedman Statistic	13.650	Probability	.01 < P < .001

Since the probability of a Friedman statistic value of 13.650 occurring by chance is less than .01 the null hypothesis was rejected. The means for members' satisfaction with process under centralist, majority, and consensus arrangements were 56.6, 60.9, and 62.8, respectively; and the sums of ranks were 46.5, 58.5, and 75.0,





respectively. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the scores from the centralist and the majority treatments and from the centralist and the consensus treatments were found to differ significantly. These findings suggested that group members were less satisfied with the process by which a decision was reached when they operated under the centralist arrangement than when they operated under either the majority or the consensus arrangement.

### *Hypothesis III.2*

Hypothesis III.2 was that no significant differences exist in the mean ranks of the leaders' scores on the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for each leader were obtained by totalling his responses to the 13 items of the process scale. Table XVI contains the mean scores on the process instrument and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XVI

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR LEADERS' SATISFACTION WITH PROCESS  
UNDER THREE DECISION-RULES

(N = 6)

	Centralist	Majority	Consensus
Means	60.7	62.2	64.2
Sums of Ranks	12.0	11.0	13.0
Friedman Statistic	0.333	Probability	.956





Since the probability of the occurrence by chance of a Friedman statistic of 0.333 is greater than .05 the null hypothesis could not be rejected. The results of the test suggested that there was no association between the decision-rule under which the group operated and the leaders' satisfaction with the process by which the decision was reached.

### *Hypothesis III.3*

Hypothesis III.3 was that no significant differences exist in the mean ranks of the individuals' scores on the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for each non-leader member were obtained by totalling his responses to the 13 items of the process scale. Table XVII contains the mean scores on the process instrument and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XVII

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR INDIVIDUALS' SATISFACTION WITH PROCESS  
UNDER THREE DECISION-RULES  
(N = 24)

	Centralist	Majority	Consensus
Means	55.6	60.6	62.5
Sums of Ranks	34.5	47.5	62.0
Friedman Statistic	15.771	Probability	P < .001



Since the probability of the occurrence by chance of a Friedman statistic value of 15.771 is less than .001 the null hypothesis was rejected. The means for individuals' satisfaction with process under the centralist, the majority, and the consensus arrangements were 55.6, 60.6, and 62.5, respectively; and the sums of ranks were 34.5, 47.5, and 62.0, respectively. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the scores from the centralist and the majority treatments and the centralist and the consensus treatments were found to differ significantly. These findings suggested that non-leader members of the group were less satisfied with the process by which a decision was reached when the group operated under the centralist arrangement than when it operated under either the majority or the consensus arrangement.

In summary, when all 13 items of the process instrument were combined, relationships were found between decision-rule and satisfaction with the process on the part of all members taken together and on the part of non-leader members taken separately. No significant relationship was found between decision-rule and the leaders' satisfaction with the process. The following sections provide more detail concerning these relationships by presenting the results of tests of nine sub-hypotheses. These tests were carried out to determine possible differences among treatments revealed by the mean ranks of scores on the three sub-scales of the process instrument using data from all members, leaders only, and individuals only.



*Sub-hypothesis III.1(a)*

Sub-hypothesis III.1(a) was that no significant differences exist in the mean ranks of the group members' scores on the "performance facilitation" sub-scale of the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the members were obtained by totalling their responses to the seven items of the "performance facilitation" sub-scale. Table XVIII contains the members' mean scores on the "performance facilitation" sub-scale and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XVIII

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY FOR  
GROUP MEMBERS' SCORES ON THE PERFORMANCE FACILITATION  
SUB-SCALE UNDER THREE DECISION-RULES

(N = 30)

	Centralist	Majority	Consensus
Means	34.1	35.2	35.8
Sums of Ranks	48.0	63.5	68.5
Friedman Statistic	7.616	Probability	.02 < P < .05

Since the probability of the occurrence by chance of a Friedman statistic value of 7.616 is less than .05 the null hypothesis was rejected. The means for group members' scores on the "performance





facilitation" sub-scales under the centralist, the majority, and the consensus arrangements were 34.1, 35.2, and 35.8, respectively; and the sums of ranks were 48.0, 63.5, and 68.5, respectively. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the scores from the centralist and the consensus arrangements were found to differ significantly.

These findings suggested that group members were less satisfied with the extent to which free discussion was carried on in an attempt to solve the problem when the groups operated under the centralist arrangement than when they operated under the consensus arrangement.

#### *Sub-hypothesis III.1(b)*

Sub-hypothesis III.1(b) was that no significant differences exist in the mean ranks of the group members' scores on the "task achievement" sub-scale of the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the members were obtained by totalling their responses to the three items of the "task achievement" sub-scale. Table XIX contains the members' mean scores on the "task achievement" sub-scale and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.



TABLE XIX

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR GROUP MEMBERS' SCORES ON THE TASK ACHIEVEMENT  
SUB-SCALE UNDER THREE DECISION-RULES

(N = 30)

	Centralist	Majority	Consensus
Means	10.1	13.1	13.7
Sums of Ranks	45.5	65.5	69.0
Friedman Statistic	10.717	Probability	.001 < P < .01

Since the probability of the occurrence by chance of a Friedman statistic value of 10.717 is less than .01 the null hypothesis was rejected. The means for group members' scores on the "task achievement" sub-scale under the centralist, the majority, and the consensus arrangements were 10.1, 13.1, and 13.7, respectively; and the sums of ranks were 45.5, 65.5, and 69.0, respectively. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the scores from the centralist and majority treatments and the centralist and consensus treatments were found to differ significantly.

These findings suggested that group members obtained less satisfaction from task achievement when the groups operated under the centralist arrangement than when they operated under either the majority or the consensus arrangement.



### *Sub-hypothesis III.1(c)*

Sub-hypothesis III.1(c) was that no significant differences exist in the mean ranks of the group members' scores on the "discussion adequacy" sub-scale of the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the members were obtained by totalling their responses to the three items of the "discussion adequacy" sub-scale. Table XX contains the members' mean scores on the "discussion adequacy" sub-scale and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XX

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR GROUP MEMBERS' SCORES ON THE DISCUSSION ADEQUACY  
SUB-SCALE UNDER THREE DECISION-RULES

(N = 30)

	Centralist	Majority	Consensus
Means	12.4	12.5	13.3
Sums of Ranks	56.0	54.0	70.0
Friedman Statistic	5.066	Probability	.05 < P < .1

Since the probability of the occurrence by chance of a Friedman statistic value of 5.066 is greater than .05 the null hypothesis could not be rejected. The results of the test suggested that there was



no significant relationship between the decision-rule and the members' satisfaction with the amount of discussion that preceded the final decision.

*Sub-hypothesis III.2(a)*

Sub-hypothesis III.2(a) was that no significant differences exist in the mean ranks of the leaders' scores on the "performance facilitation" sub-scale of the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the leaders were obtained by totalling their responses to the seven items of the "performance facilitation" sub-scale. Table XXI contains the leaders' mean scores on the "performance facilitation" sub-scale and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XXI

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR LEADERS' SCORES ON THE PERFORMANCE FACILITATION  
SUB-SCALE UNDER THREE DECISION-RULES

(N = 6)

	Centralist	Majority	Consensus
Means	36.0	37.3	37.3
Sums of Ranks	10.0	12.0	14.0
Friedman Statistic	1.333	Probability	.570





Since the probability of the occurrence by chance of a Friedman statistic value of 1.333 is greater than .05 the null hypothesis could not be rejected. The results of the test suggested that there was no significant relationship between the decision-rule under which the groups operated and the leaders' satisfaction with the extent to which free discussion was carried on in an attempt to solve the problem.

*Sub-hypothesis III.2(b)*

Sub-hypothesis III.2(b) was that no significant differences exist in the mean ranks of the leaders' scores on the "task achievement" sub-scale of the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the leaders were obtained by totalling their responses to the three items of the "task achievement" sub-scale. Table XXII contains the leaders' mean scores on the "task achievement" sub-scale and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XXII  
MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR LEADERS' SCORES ON THE TASK ACHIEVEMENT SUB-SCALE  
UNDER THREE DECISION-RULES

(N = 6)

	Centralist	Majority	Consensus
Means	11.8	11.7	12.5
Sums of Ranks	11.5	13.0	11.5
Friedman Statistic	0.250	Probability .956 < P < 1.000	



Since the probability of the occurrence by chance of a Friedman statistic value of 0.250 is greater than .05 the null hypothesis could not be rejected. The results of the test suggested that there was no significant relationship between the decision-rule under which the groups operated and the leaders' satisfaction with task achievement.

*Sub-hypothesis III.2(c)*

Sub-hypothesis III.2(c) was that no significant differences exist in the mean ranks of the leaders' scores on the "discussion adequacy" sub-scale of the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the leaders were obtained by totalling their responses to the three items of the "discussion adequacy" sub-scale. Table XXIII contains the leaders' mean scores on the "discussion adequacy" sub-scale and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XXIII  
MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR LEADERS' SCORES ON THE DISCUSSION ADEQUACY  
SUB-SCALE UNDER THREE DECISION-RULES

(N = 6)

	Centralist	Majority	Consensus
Means	12.8	13.2	14.3
Sums of Ranks	9.5	11.0	15.5
Friedman Statistic	3.250	Probability	.184 < P < .252



Since the probability of the occurrence by chance of a Friedman statistic value of 3.250 is greater than .05 the null hypothesis could not be rejected. The results of the test suggested that there was no significant relationship between the decision-rule under which the groups operated and the leaders' satisfaction with the adequacy of the discussion that precedes the final decision.

*Sub-hypothesis III.3(a)*

Sub-hypothesis III.3(a) was that no significant differences exist in the mean ranks of the individuals' scores on the "performance facilitation" sub-scale of the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the individuals were obtained by totalling their responses to the seven items of the "performance facilitation" sub-scale. Table XXIV contains the individuals' mean scores on the "performance facilitation" sub-scale and the sum of ranks under each each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

Since the probability of the occurrence by chance of a Friedman statistic value of 6.437 is less than .05 the null hypothesis was rejected. The means for individuals' scores on the "performance facilitation" sub-scale under the centralist, the majority, and the consensus arrangements were 33.7, 34.7, and 35.4, respectively; and





the sums of ranks were 38.0, 51.5, and 54.5, respectively. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the scores from the centralist and majority treatments and from the centralist and consensus treatments were found to differ significantly.

TABLE XXIV

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY FOR  
INDIVIDUALS' SCORES ON THE PERFORMANCE FACILITATION  
SUB-SCALE UNDER THREE DECISION-RULES

(N = 24)

	Centralist	Majority	Consensus
Means	33.7	34.7	35.4
Sums of Ranks	38.0	51.5	54.5
Friedman Statistic	6.437	Probability	.02 < P < .05

These findings suggested that individuals were less satisfied with the extent to which free discussion was carried on in an attempt to solve the problem when the groups operated under the centralist arrangement than when they operated under either the majority or the consensus arrangement.

#### *Sub-hypothesis III.3(b)*

Sub-hypothesis III.3(b) was that no significant differences exist in the mean ranks of the individuals' scores on the "task achievement" sub-scale of the process instrument when the groups



operate under the centralist, the majority, and the consensus arrangements.

The data for the individuals were obtained by totalling their responses to the three items of the "task achievement" sub-scale. Table XXV contains the individuals' mean scores on the "task achievement" sub-scale and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XXV

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR INDIVIDUALS' SCORES ON THE TASK ACHIEVEMENT  
SUB-SCALE UNDER THREE DECISION-RULES

(N = 24)

	Centralist	Majority	Consensus
Means	9.7	13.5	14.0
Sums of Ranks	34.0	52.5	57.5
Friedman Statistic	12.771	Probability .001 < P < .01	

Since the probability of the occurrence by chance of a Friedman statistic value of 12.771 is less than .01 the null hypothesis was rejected. The means for the individuals' scores on the "task achievement" sub-scale under the centralist, the majority, and the consensus arrangements were 9.7, 13.5, and 14.0, respectively; and the sums of ranks were 34.0, 52.5, and 57.5, respectively. When the three treatments were compared in pairs using the Wilcoxon



matched-pairs signed-ranks test the scores from the centralist and the majority treatments and from the centralist and consensus treatments were found to differ significantly.

These findings suggested that individuals obtained less satisfaction from task achievement when the groups operated under the centralist arrangement than when they operated under either the majority or the consensus arrangement.

*Sub-hypothesis III.3(c)*

Sub-hypothesis III.3(c) was that no significant differences exist in the mean ranks of the individuals' scores on the "discussion adequacy" sub-scale of the process instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the individuals were obtained by totalling their responses to the three items of the "discussion adequacy" sub-scale. Table XXVI contains the individuals' mean scores on the "discussion adequacy" sub-scale and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XXVI

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR INDIVIDUALS' SCORES ON THE DISCUSSION ADEQUACY  
SUB-SCALE UNDER THREE DECISION-RULES

(N = 24)

	Centralist	Majority	Consensus
Means	12.3	12.4	13.1
Sums of Ranks	46.5	43.0	54.5
Friedman Statistic	2.896	Probability	.20 < P < .30





Since the probability of the occurrence by chance of a Friedman statistic value of 2.896 is greater than .05 the null hypothesis could not be rejected. The results of the test suggested that there was no significant relationship between the decision-rule under which the groups operated and the individuals' satisfaction with the amount of discussion that preceded the final decision.

In summary, nine sub-hypotheses were tested in an attempt to demonstrate relationships between decision-rule and the responses of group members, leaders, and individuals to the three sub-scales of the process instrument. The results indicated a relationship between the decision-rule employed and the responses of both group members and individuals to the "performance facilitation" and "task achievement" sub-scales. No significant relationships were found between the decision-rule employed and the leaders' responses to any of the three sub-scales. However, the trend indicated for the leaders was consistent. In every case the mean score for leaders was higher under the consensus arrangement than under the centralist arrangement.

#### Commitment to Decision

Tests of three hypotheses were carried out in an attempt to demonstrate relationships between the decision-rule and the subjects' commitment to the decision reached. The data were obtained by administering the decision instrument immediately following the





decision-making sessions. Again the data were arranged to form three different groupings. The data from all subjects were first considered as a unit, following which the same data were divided into two parts in order that the leaders' responses might be considered separately from the responses of other individuals in the groups. The data from these three groupings were used to test hypotheses IV.1, IV.2, and IV.3.

### *Hypothesis IV.1*

Hypothesis IV.1 was that no significant differences exist in the mean ranks of the group members' scores on the decision instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the members were obtained by totalling their responses to the seven items of the decision instrument. Table XXVII contains the members' mean scores on the decision instrument and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XXVII

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR MEMBERS' COMMITMENT TO DECISION UNDER  
THREE DECISION-RULES

(N = 30)

	Centralist	Majority	Consensus
Means	26.0	32.9	30.1
Sums of Ranks	49.0	75.0	56.0
Friedman Statistic	12.066	Probability	.001 < P < .01



Since the probability of the occurrence by chance of a Friedman statistic value of 12.066 is less than .01 the null hypothesis was rejected. The means for the members' scores on the decision instrument under the centralist, the majority, and the consensus arrangements were 26.0, 32.9, and 30.1, respectively; and the sums of ranks were 49.0, 75.0, and 56.0, respectively. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the scores from the centralist and majority treatments were found to be significantly different.

These findings suggested that members were more committed to the decision reached when the groups operated under the majority arrangement than when they operated under the centralist arrangement.

#### *Hypothesis IV.2*

Hypothesis IV.2 was that no significant differences exist in the mean ranks of the leaders' scores on the decision instrument when the groups operate under the centralist, the majority, and the consensus arrangements.

The data for the leaders were obtained by totalling their responses to the seven items of the decision instrument. Table XXVIII contains the leaders' mean scores on the decision instrument and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

Since the probability of the occurrence by chance of a Friedman statistic value of 6.083 is greater than .05 the null hypothesis could not be rejected. The results of the test suggested



that there was no significant relationship between the decision-rule employed and the leaders' commitment to the decision reached.

TABLE XXVIII

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR LEADERS' COMMITMENT TO DECISION UNDER  
THREE DECISION-RULES

(N = 6)

	Centralist	Majority	Consensus
Means	36.3	31.3	25.2
Sums of Ranks	16.0	12.5	7.5
Friedman Statistic	6.083	Probability	.052 < P < .072

Although the value of the Friedman statistic was slightly lower than that required for statistical significance a strong trend was indicated by the data. Both means and sums of ranks indicated that leaders' commitment to the decision became less as the decision-rule changed from centralist, through majority, to consensus. The mean scores under the centralist, the majority, and the consensus arrangements were 36.3, 31.3, and 25.2, respectively.

#### *Hypothesis IV.3*

Hypothesis IV.3 was that no significant differences exist in the mean ranks of the individuals' scores on the decision instrument when the groups operate under the centralist, the majority, and the consensus arrangements.





Table XXIX contains the individuals' mean scores on the decision instrument and the sum of ranks under each treatment, the Friedman statistic, and the probability of a  $\chi_r^2$  value of that magnitude occurring by chance.

TABLE XXIX

MEANS, SUMS OF RANKS, AND FRIEDMAN STATISTIC PROBABILITY  
FOR INDIVIDUALS' COMMITMENT TO DECISION UNDER  
THREE DECISION-RULES

(N = 24)

	Centralist	Majority	Consensus
Means	23.4	33.3	31.4
Sums of Ranks	33.0	62.5	48.5
Friedman Statistic	18.146	Probability P < .001	

Since the probability of the occurrence by chance of a Friedman statistic value of 18.146 is less than .001 the null hypothesis was rejected. The means for the individuals' scores on the decision instrument under the centralist, the majority, and the consensus arrangements were 23.4, 33.3, and 31.4, respectively; and the sums of ranks were 33.0, 62.5, and 48.5, respectively. When the three treatments were compared in pairs using the Wilcoxon matched-pairs signed-ranks test the scores from the centralist and majority treatments and the centralist and consensus treatments were found to be significantly different.



These findings suggested that non-leader members of the groups were more committed to the decision reached when the groups operated under either the majority or consensus arrangement than when they operated under the centralist arrangement.

In summary, when the data from all subjects were combined the tests indicated that group members were more committed to the decision when the groups operated under the majority arrangement than when they operated under the centralist arrangement. However, when the data from leaders and from individuals were tested separately the results indicated that this effect was due in large part to the responses from the non-leaders. The means and sums of ranks for the leaders were greater under the centralist arrangement than under either of the other two treatments. When the data from individuals were tested separately the results indicated that individuals were more committed to the decision reached when the groups operated under either the majority or the consensus arrangement than when they operated under the centralist arrangement.

### Chapter Summary

Chapter V contains the results of analyses carried out to determine the nature of relationships between the decision-rule employed by a problem-solving group and (a) the time required to reach a decision, (b) the degree of satisfaction with the process by which the decision was reached, and (c) the degree of commitment to the decision reached.



The tests of hypotheses led to the findings listed below.

(a) There was no significant relationship between the decision-rule employed and the time required to reach a decision. However, the trend in the data indicated that the number of minutes required to reach a decision increased as the treatments changed from centralist, through majority, to consensus.

(b) All members considered together, and non-leader members considered separately, were less satisfied with the process under the centralist arrangement than under either the majority or the consensus arrangements. When the process instrument was divided into three sub-scales these same relationships held generally for both the "performance facilitation" and "task achievement" sub-scales, but did not hold for the "discussion adequacy" sub-scale. No significant relationships were found between the decision-rule employed and the leaders' satisfaction with the process. However, the data from leaders indicated trends similar to those for other group members.

(c) All members considered together were more committed to the decisions reached under the majority arrangement than to those reached under the centralist arrangement. Non-leader members were more committed to the decisions reached under both the majority and consensus arrangements than to those reached under the centralist arrangement. No significant relationship was determined between the decision-rule employed and leaders' commitment to the decision. However, the data indicated a strong trend in the opposite direction



to that produced by other group members. Leaders' commitment to the decision decreased as the decision-rule changed from centralist, to majority, to consensus.





## CHAPTER VI

### SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Chapter VI includes a summary of the methodology, design, and findings of the research project. Some conclusions and implications are drawn with reference to the findings.

#### Summary

Recent writings in organizational theory contain a recurring suggestion that individuals within organizations may in the future be permitted more direct involvement in the deliberations that precede the taking of organizational decisions. This trend would involve a shift of focus away from individual decision-making to cooperative decision-making in groups.

This study was carried out in an attempt to determine possible relationships between the decision-rules under which such groups might operate, and (a) interaction patterns within the groups, (b) the time required to reach a decision, (c) satisfaction with the process by which the decision was made, and (d) commitment to the decision reached.

#### *The Research Project*

*Conceptual framework.* References to the theories of social exchange developed by Homans (1958) and Thibaut and Kelley (1959) were made in an attempt to provide a partial explanation for the selectivity



of interaction both with respect to who interacts with whom and with respect to content. Exchange theory accounts for this selectivity in terms of the rewards and costs to the individuals involved. The theory suggests that an individual in interaction exchanges goods, material and non-material, with others in an attempt to maximize his rewards and minimize his costs.

Changes in the decision-rules under which groups operate were interpreted, in terms of the bases of power suggested by French and Raven (1959), as manipulations of the legitimate power (authority) of group members. Altering the voting procedures by which a group must reach its final decision alters the potential for influence held by individual group members. The authority granted both leaders and non-leaders under each of the three decision-rules (centralist, majority, and consensus) was analyzed.

Suggestions, based on these theoretical formulations, were made concerning possible relationships between the independent variable (decision-rule) and the dependent variables (interaction patterns, decision-time, satisfaction with process, and commitment to decision). Wherever possible the suggestions concerning possible relationships were supported by research findings.

*Research design and methodology.* The study was structured around a repeated measures design with three treatments (decision-rules) being applied to each of six groups. Each group met once under each of the decision-rules (centralist, majority, and consensus) to reach a



decision concerning three different educational problems. The problems, presented in the form of case studies, were distributed to the subjects prior to the decision-making sessions in order that they might come to a personal decision before meeting in groups. The three decision-rules, the three sessions, and the three discussion problems were assigned to the six groups in combinations designed to control a number of variables presumed to be associated with the behavior of group members in a problem-solving situation.

The sample consisted of 30 students selected from the class lists of a graduate course in educational administration at the University of Alberta. The subjects were assigned, using a table of random numbers, to six five-man groups. The person named last to each group was designated chairman for the group.

All discussion sessions were held in the television studio of the Audio-Visual Media Center of the Faculty of Education in order that they could be recorded on television tapes. Group members were seated to form a "V" pattern, with the chairman seated at the head of the "V" facing the other four members.

At the beginning of each session the forms on which the subjects had recorded their personal decisions were collected, and written descriptions of the role to be played by each member and of the rules under which the group was to operate were distributed to the subjects. All groups were required to reach a decision before they adjourned. No limit was set on discussion time.





During and following the discussions data were collected concerning the source and direction and the content of communications, the time required to reach a decision, the subjects' satisfaction with the process by which the decision was reached, and the subjects' commitment to the decision. The means by which these data were collected are described below.

*Data collection and analysis.* The major task in connection with data collection was the coding of interaction. All verbal communications were coded according to both content and source and direction using 30 categories derived from Bales' Interaction Process Analysis (Bales, 1950). The unit of interaction was any segment of verbal behavior that contained a complete idea. Each unit of interaction was coded by placing a tally mark in one of the 30 categories of the interaction coding form (Figure 1).

Each of the eighteen discussion sessions was coded at least four times. The first codings were completed while the groups were actually involved in discussion. These "live" readings were followed by three others taken from the videotapes. Data from the final readings only were used to test the hypotheses.

Data concerning the subjects' commitment to the decision and satisfaction with the process were obtained by administering two instruments developed for the purpose (Appendix B). For ease of reference these instruments were called the decision instrument and the process instrument. Subjects completed both instruments



immediately following the adjournment of each discussion session.

The data used to determine relationships between the decision-rule employed and the time required to reach a decision were obtained by recording the number of minutes between the time when the signal was given for the discussion to begin and the time when the final decision was reached.

In all, 56 tests of hypotheses and sub-hypotheses were carried out using raw data, and an additional 40 tests were carried out using percentage data in connection with a special analysis. In each case the hypothesis tested was a non-directional null hypothesis stating that there are no differences in the mean ranks of scores on the criterion measure when groups operate under the centralist, the majority, and the consensus decision-rules. All tests were made using the Friedman two-way analysis of variance. The Friedman test was followed by a comparison of the treatments in pairs using the Wilcoxon matched-pairs signed-ranks test.

### *Findings*

*Decision-rules and interaction patterns.* The data from the 30 interaction categories were tested separately and in a number of combinations in an attempt to demonstrate differences in interaction patterns under the three decision-rules. Tests of the attribution (source and direction) categories indicated that non-leader members addressed more communications and a greater proportion of their communications to the group as a whole when the group was operating



under the consensus arrangement than when it was operating under the centralist arrangement. When the individual-to-group data were analyzed according to content as well as attribution the tests revealed that, in particular, individuals addressed more information, more suggestions and opinions, and a greater proportion of suggestions and opinions to the group under the consensus arrangement than under the centralist arrangement.

Tests of the content categories indicated that group members gave more positive reactions to the statements of other group members when the group was operating under the consensus arrangement than when it was operating under the centralist arrangement.

Finally, tests carried out on the categories formed when the attribution and content categories were combined indicated, in addition to what has already been reported above, that the member designated to act as the leader asked for more opinions and suggestions from the group under the consensus arrangement than under the centralist arrangement. The analyses also indicated that a greater proportion of the leaders' communications to individuals were in the "asks information" category under both the majority or consensus arrangement than under the centralist arrangement. However, because of the very small mean percentages involved this last finding was accepted with caution.

The use of non-directional hypotheses, small samples, and non-parametric statistics created a situation in which differences





among treatments had to be large to be statistically significant. References were made, therefore, to possible trends in the data indicated by relatively large, but not statistically significant, differences in means.

When the three general categories, total communication, communication from leaders, and communication from individuals, were considered, the data indicated a consistent trend toward increasing amounts of communication being initiated as the treatments changed from centralist, to majority, to consensus.

In the attribution (source and direction) categories the trends indicated that, in addition to individuals addressing their communications more to the group as a whole (statistically significant difference), leaders addressed more communications to the group, and individuals addressed more communications to other individuals as the treatment changed from centralist to consensus. Interaction between leaders and individuals did not show this same trend.

In the content categories data trends suggested that group members under the consensus arrangement, in addition to giving more positive reactions (statistically significant difference), gave more suggestions and opinions, asked for more suggestions and opinions, and asked for more information than under the centralist arrangement. No marked differences occurred in either the amount of information given or the number of negative reactions given under the three treatments.

When the content and attribution categories were analyzed in combination the following trends were indicated:





(a) The leader, in addition to asking for more suggestions and opinions from the group (statistically significant difference) under the consensus arrangement, tended to *give* more suggestions and opinions to the group under that arrangement than under the centralist arrangement.

(b) The leader tended to give more positive reactions to individuals under the consensus arrangement than under the centralist arrangement.

(c) Individuals under the consensus arrangement, in addition to giving more suggestions and opinions and more information to the group (statistically significant differences) than under the centralist arrangement, may have tended to ask for more opinions and suggestions from other individuals than they did under the centralist arrangement. However, the numbers in the latter category were small.

(d) Individuals may have tended to give the leader more positive reactions and to ask for more suggestions and opinions of him under the consensus arrangement than under either of the other two arrangements. Again the numbers involved were small.

(e) Individuals tended to give more positive reactions, more suggestions and opinions, and more information to other individuals, and to ask for more information, and for more opinions and suggestions from other individuals under the consensus arrangement than under the centralist arrangement.

*Decision-rules and outcomes.* Tests of seven hypotheses and nine sub-hypotheses were carried out to determine relationships



between the decision-rule employed and (a) the time required to reach a decision, (b) the degree of satisfaction with the process by which the decision was reached, and (c) the degree of commitment to the decision reached.

No significant relationship was demonstrated between the decision-rule employed and the time required to reach a decision. However, the trend was for the time required to reach a decision to increase as the decision-rule changed from centralist to majority to consensus.

The data from the instrument designed to test satisfaction with the process were arranged into three groupings. First, the data for all group members were considered together. Next, the same data were divided into two parts with the data from the leaders being tested separately from the data of the non-leaders. Tests of the three hypotheses developed with reference to these three groupings were carried out using data obtained by totalling responses to the items of the process instrument.

When data from all group members were tested the results indicated that group members were less satisfied with the process by which a decision was reached when they operated under the centralist arrangement than when they operated under either the majority or the consensus arrangements. The same findings were obtained when data from non-leader members were considered separately. No statistically significant relationship was demonstrated to exist between the decision-rules under which the groups operated and the leaders'



satisfaction with the process, and no trend was evident in the data.

Results of factor analyses of the data obtained from the process instrument indicated that the instrument could be interpreted as a test of three domains. On the basis of these results the 13 items were arranged to form three sub-scales, which were entitled "performance facilitation," "task achievement," and "discussion adequacy." Tests of nine sub-hypotheses were carried out to determine possible differences among treatments revealed by the mean ranks of scores on the three sub-scales using data from all members, leaders only, and individuals only.

When the data from all members were considered the findings suggested (a) that group members were more satisfied under the consensus arrangement than under the centralist arrangement with the extent to which free discussion was carried on in an attempt to solve the problem, and (b) that group members obtained more satisfaction from task achievement when the groups operated under either the majority or the consensus arrangement than when they operated under the centralist arrangement.

When the data from the non-leader members (individuals) were considered the results were the same as for all members with one exception. Non-leader members were more satisfied with the extent to which free discussion was carried on in an attempt to solve the problem under both the majority and consensus arrangements than under the centralist arrangement.





No statistically significant relationships were determined between decision-rules and the leaders' scores on any of the sub-scales. The trend, however, was for the leaders to be more satisfied under the consensus arrangement than under the centralist arrangement. Nor were any significant relationships found between decision-rules and the scores for any of the three groups of subjects on the "discussion adequacy" sub-scale.

The data from the instrument designed to test commitment to decision were arranged, as before, into three groupings. Hypotheses were tested using data from all members, from leaders, and from non-leaders. The findings suggested that group members were more committed to the decision reached when the groups operated under the majority arrangement than when they operated under the consensus arrangement. Non-leader members of the group were more committed to the decision reached when the groups operated under either the majority or the consensus arrangement than when they operated under the centralist arrangement. No statistically significant relationships were found between the decision-rule employed and the leaders' commitment to the decision. However, the data indicated a strong tendency for the leaders' commitment to the decision to reduce as the decision-rule changed from centralist to majority to consensus.

### Conclusions

#### *Limitations*

Conclusions were drawn from the findings of the study against the background of the limitations outlined in Chapter I. These



limitations are summarized below.

First, restrictions placed on the study by the costs involved made necessary the use of small samples, which in turn placed restrictions on the general design. Second, all observations of interaction were made by the researcher working along, and the instruments used to measure satisfaction with process and commitment to decision were created by the researcher. The results, therefore, could reflect biases brought about by the researcher's personal preferences or his knowledge of the hypotheses being tested. Third, no evidence, beyond what was provided by the results of the study, was available concerning the reliability and validity of the process and decision instruments. Finally, the possibility of generalizing the findings was reduced both by the type of subjects used and the laboratory-like conditions under which the discussions were conducted.

#### *Decision-rules and Interaction*

*General categories and decision-time.* The most obvious general trend in the interaction data was for the group to discuss for longer periods of time (and, therefore, to produce a greater number of communications) as the decision-rule changed from centralist, to majority, to consensus. Although no significant differences were found, the trend was evident both in the number of minutes required to reach a decision and in the number of communications recorded in the most general categories (total communication, communication from the leader, and communication from individuals).



This trend was consistent with the relationship between decision-rule and decision-time suggested in Chapter II. The suggestion was that the time required to reach a decision would increase as the authority of the leader decreased and the authority of the other group members increased. A similar trend was noted by Bower (1965) who found that subjects under the unanimity requirement had more difficulty reaching a decision in the time allowed than those under the majority arrangement.

*Attribution (source and direction).* Two suggestions were made in Chapter II in connection with the numbers of communications initiated by the appointed leaders. First, the suggestion was made that the leader, in an attempt to locate support for his decision, would address more communications to individuals under the centralist arrangement than under the consensus arrangement. Second, the leader was expected to address more communications to the group as a whole under the consensus arrangement than under the centralist arrangement.

The first suggestion was not supported by the data. In fact, the leader tended to address more communications to individuals under the consensus arrangement than under the centralist arrangement. The second suggestion was supported by a strong trend in the data, although the differences were not demonstrated to be statistically significant.

Two suggestions were made also with respect to communications initiated by non-leader members. They were that non-leader members might be expected to address more communications to the leader under the centralist arrangement than under the consensus arrangement, and





that they, like the leader, might be expected to address more communications to the group as a whole under the consensus arrangement than under the centralist arrangement.

Again the data provided no support for the first suggestion. The mean numbers of communications under the three treatments were almost equal. The second suggestion, however, received strong support from the data. Non-leader members under the consensus arrangement addressed significantly more communications to the group as a whole than under the centralist arrangement. In addition, a trend in the data indicated that non-leader members also addressed more communications to other non-leader members under the consensus arrangement than under the centralist arrangement.

In summary, both leaders and non-leaders tended to address more communications both to the group as a whole and to non-leader members under the consensus arrangement than under the centralist arrangement. There was, however, no evidence that non-leader members communicated more with the leader under one arrangement than under another.

The tendency for both leaders and non-leaders to address more communications to individual non-leaders was not anticipated in the suggestions made in Chapter II. An explanation for the finding may lie in the well-documented tendency for group members to address a high number of communications to deviates (Berkowitz and Howard, 1959; Emerson, 1954; Festinger and Thibaut, 1951; Gerard, 1953; Schachter, 1951). After some degree of consensus is recognized within the group, those who are in agreement, in an attempt to reduce the remaining





differences in opinion, may tend to address individuals who deviate.

This explanation, however, should apply equally as well to the leader as to other members. However, as noted above, there is no evidence that more communications were addressed to the leader under the consensus arrangement than under the centralist arrangement. Perhaps the tendency anticipated in Chapter II for non-leader members to address more communications to the leader under the centralist arrangement is offset by the tendency for non-leader members to address more communications to leader deviates under the consensus arrangement.

*Content.* In Chapter II the suggestion was made with respect to the content of communications that under consensus a larger number of communications specifically designed to influence could be expected than under the centralist arrangement. In particular, group members were expected to give more suggestions and opinions and to provide more positive reactions under consensus. This suggestion was supported by the data. Significantly more positive reactions were given under the consensus arrangement than under the centralist arrangement. In addition, there were trends for members to give more suggestions and opinions, and for members to make more requests for both suggestions and information under the consensus arrangement than under the centralist arrangement.

*Attribution and content combined.* When the attribution and content categories were combined a total of 30 categories were formed.



The data within these categories indicated certain trends.

All members of groups operating under the consensus arrangement tended to give more positive reactions to other members, tended to ask more suggestions and opinions of the group as a whole, and tended to give more suggestions and opinions to the group as a whole. In addition, non-leader members under consensus tended to ask more information from the group as a whole, tended to ask for more suggestions and opinions from the leader, tended to give more suggestions and opinions and more information to other non-leader members, and tended to ask for more suggestions and opinions from other non-leader members than under the centralist arrangement. In short, under the consensus arrangement a tendency exists for group members to request and to exchange more ideas and information and to be more supportive than under the centralist arrangement.

#### *Decision-rules and Satisfaction with Process*

Immediately following each discussion session subjects completed an instrument designed to test satisfaction with process. As a result of factor analyses carried out with the data two items were eliminated and the remaining 13 items were arranged to form three sub-scales entitled "performance facilitation," "task achievement," and "discussion adequacy."

The results of the analyses of the data from the process instrument were consistent. When the 13 items were considered as a unit no significant differences among treatments were found for the



leaders, but the non-leader members indicated significantly more satisfaction with the process under both the majority and the consensus arrangements than under the centralist arrangement. These findings were repeated with the data from the "performance facilitation" and "task achievement" sub-scales, and a similar trend was evident in the data from the "discussion adequacy" sub-scale.

These findings were consistent with the suggestions made in Chapter II with respect to satisfaction with process except that the leaders did not indicate greater satisfaction under the centralist arrangement as expected. The conclusion is evident. Non-leader members of groups operating under the centralist arrangement are less satisfied with the process by which the decision is reached than when they are operating under either the majority or the consensus arrangement.

*Decision-rules and commitment to decision.* Immediately following each discussion session group members completed, in addition to the process instrument, an instrument designed to test commitment to the decision reached. Seven of the original eight items were retained in the instrument.

The results of the analyses of data from the instrument indicated that non-leader members were significantly more committed to the decisions reached under both the majority and consensus arrangements than to decisions reached under the centralist arrangement. The leaders, however, tended to be more satisfied with the decisions reached under the centralist arrangement.





These relationships between decision-rule and commitment to decision are those that were anticipated in Chapter II. The leader, because he makes the decision personally under the centralist arrangement, could be expected to be more highly committed to it than to a decision reached under either of the other two arrangements. The greater commitment of non-leader members to decisions made under the majority and consensus arrangements might be attributed to the fact that under these arrangements non-leader members have greater potential for influencing the final decisions.

*Summary of conclusions.* A general trend for the largest differences in criterion measures to occur between the centralist and consensus treatments is evident. A large percentage of the statistically significant differences occurred between measures under the centralist and consensus arrangements. A few occurred between the measures under the centralist and majority arrangements. None occurred between measures under the majority and consensus treatments. With very few exceptions the mean numbers under the majority treatment fell between the mean numbers under the other two treatments.

A second general trend is for both the number of minutes required to reach a decision and the number of communications initiated to increase as the decision-rule changes from centralist to majority to consensus.

With respect to interaction patterns, a tendency exists for group members under the consensus arrangement to request and to exchange



more ideas and information and to be more supportive than under the centralist arrangement.

With respect to outcomes, non-leader members are more satisfied with the process and more committed to the decision under both the majority and consensus arrangements than they are under the centralist arrangement.

### Implications

#### *Implications for Further Research*

The study employed at least two novel approaches. First, the general problem studied was new in that an attempt was made to determine relationships between an input (decision-rules) and certain outcomes (satisfaction with process and commitment to decision), and between the input and the intermediate process (as reflected in interaction patterns). Second, the procedures used to obtain data were new in some respects. Further research could build on what has been learned in both these areas.

Limitations of the study make caution necessary with respect to the acceptance of the findings and conclusions. Nevertheless, the relationships suggested between decision-rules and outcomes and between decision-rules and interaction patterns were consistent enough, and their implications are important enough, to warrant further investigation. The first need is for a replication of the study with a sample large enough to permit more effective use of statistical analyses. A second need is for replications of the



study with subjects representative of different and larger populations. As a first step random samples of practicing teachers could be employed.

The instruments used to measure satisfaction with process and commitment to decision require further development. Their use in additional studies would make possible improvements in the items and a more rigorous evaluation of reliability and validity.

The methods used to code interaction could be refined. The use of television cameras to record interaction before it was coded proved to be an effective technique. Experience showed that even after many hours of practice the coder failed to record many units of interaction during the first coding. The problem was particularly acute in situations where during the discussions a number of persons spoke at the same time. However, since during the viewing videotapes can be stopped at any point and can be replayed as many times as necessary, highly accurate coding from videotapes is possible. The coding procedure could be improved even further by using at least two well-trained coders who are unaware of the hypotheses being tested. This procedure would make possible better reliability checks, and would reduce the possibility of biases being reflected in the coding. The fact that interaction can be stored on videotape creates many new possibilities for research, since data pertaining to a number of different questions can be obtained from the same interaction sequence.





*Implications for Educational Administration*

If the conclusions of the study are applicable to educational organizations they have important implications. First, if commitment to the decision reached and satisfaction with the process are important considerations, then changes in the usual method of involving subordinates in decision-making committees may be required. Within the usual organizational structure individuals, rather than groups, are held responsible for the consequences of decisions. As a result, subordinates are usually involved in decision-making under a centralist arrangement in order that the leader can make the decisions for which he is held responsible. The results of this study, however, suggest that the involvement of subordinates under the centralist arrangement produces less satisfaction with process and less commitment to decision than involvement under the majority and centralist arrangements. The implication is that if subordinates are to be involved in the decision-making process they should be given increased potential for influencing the final decision through the use of the majority or, preferably, the consensus decision-rule.

Second, the results indicated a tendency for the decision-time required to increase as the decision-rule changed from centralist to majority, to consensus. This finding suggests at least one of the costs that might be involved in employing the consensus decision-rule with decision-making groups. Costs arising from delayed decisions and the need for additional personnel could be extensive.





## BIBLIOGRAPHY

- Argyris, C. Being human and being organized. In E. P. Hollander, and R. C. Hunt (Eds.), *Current perspectives in social psychology*. New York: Oxford University Press, 1967.
- Back, K. W., Festinger, L., Hymovitch, B., Kelley, H., Schachter, S., & Thibaut, J. The methodology of studying rumor transmission. *Human Relations*, 1950, 3, 307-312.
- Bales, R. F. *Interaction process analysis*. Cambridge, Mass.: Addison-Wesley, 1950.
- Bales, R. F., Strodtbeck, F. L., Mills, T. M. and Roseborough, M. E. Channels of communication in small groups. *American Sociological Review*, 1951, 16, 461-468.
- Bass, B. M. *Leadership, psychology and organizational behavior*. New York: Harper, 1960.
- Bates, A. P. Some sociometric aspects of social ranking in a small, face-to-face group. *Sociometry*, 1952, 15, 330-341.
- Bavelas, A. Communication patterns in task-oriented groups. *Journal of the Acoustical Society of America*, 1950, 22, 725-730.
- Bennett, E. B. Discussion, decision, commitment, and consensus in "group decision". *Human Relations*, 1955, 8, 251-273.
- Bennis, W. G. Beyond bureaucracy. In E. P. Hollander, and R. C. Hunt (Eds.), *Current perspectives in social psychology*. New York: Oxford University Press, 1967.
- Bennis, W. G. (Ed.), *Interpersonal dynamics: Essays and readings on human interaction*. Homewood, Ill.: Dorsey Press, 1968.
- Bennis, W. G., Benne, K. D., and Chin, R. (Eds.), *The planning of change*. New York: Holt, Rinehart, and Winston, 1961.
- Berkowitz, L., and Howard, R. C. Reactions to opinion deviates as affected by affiliation need and group member interdependence. *Sociometry*, 1959, 22, 81-91.
- Blau, P. M. *Exchange and power in social life*. New York: Wiley, 1964.
- Blau, P. M., and Scott, W. R. *Formal organizations: A comparative approach*. San Francisco: Chandler, 1962.



- Bond, B. W. The group-discussion-decision approach: An appraisal of its use in health education. *Dissertation Abstracts*, 1956, 16, 903-904.
- Borgatta, E. F. Analysis of social interaction and sociometric perception. *Sociometry*, 1954, 17, 7-32.
- Bower, J. L. Group decision-making: A report of an experimental study. *Behavioral Science*, 1965, 10, 277-289.
- Boyd, R. D., and Devault, M. V. The observation and recording of behavior. *Review of Educational Research*, 1966, 36, 529-551.
- Bridges, E. M., Doyle, W. F., and Mahan, D. F. Effects of hierarchical differentiation on group productivity, efficiency, and risk taking. *Administrative Science Quarterly*, 1968, 13, 305-319.
- Cartwright, D. Power: A neglected variable in social psychology. In D. Cartwright (Ed.), *Studies in social power*. Ann Arbor, Mich.: The University of Michigan, 1959 (a).
- Cartwright, D. (Ed.) *Studies in social power*. Ann Arbor, Mich.: The University of Michigan, 1959 (b).
- Caudill, W. A. *The psychiatric hospital as a small society*. Cambridge, Mass.: Harvard University Press, 1958.
- Coch, L. and French, J. R. P. Jr. Overcoming resistance to change. *Human Relations*, 1948, 1, 512-533.
- Cohen, A. M., Bennis, W. G., and Wolkow, G. H. The effect of changes in communication networks on the behavior of problem-solving groups. *Sociometry*, 1962, 25, 177-196.
- Cohen, A. R. Upward communication in experimentally created hierarchies. *Human Relations*, 1958, 11, 41-53.
- Collins, B. E. The interaction of status and communication: Some hypotheses and an empirical test. Unpublished M. A. thesis, Northwestern University, 1963.
- Collins, B. E. and Guetzkow, H. *A social psychology of group processes for decision-making*. New York: Wiley, 1964.
- Emerson, R. M. Deviation and rejection: An experimental replication. *American Sociological Review*, 1954, 19, 688-693.
- Festinger, L. The role of group belongingness in a voting situation. *Human Relations*, 1948, 1, 154-180.





- Festinger, L. Informal social communication. *Psychological Review*, 1950, 57, 271-282.
- Festinger, L. A theory of social comparison processes. In P. A. Hare, E. F. Borgatta and R. F. Bales (Eds.), *Small Groups*. New York: Knopf, 1966.
- Festinger, L. and Thibaut J. Interpersonal communication in small groups. *Journal of Abnormal and Social Psychology*, 1951, 46, 92-99.
- French, J. R. P. A formal theory of social power. *The Psychological Review*, 1956, 63, 181-194.
- French, J. R. P., and Raven, B. The bases of social power. In D. Cartwright (Ed.), *Studies in social power*. Ann Arbor, Mich.: The University of Michigan, 1959.
- Gerard, H. B. The effect of different dimensions of disagreement on the communication process in small groups. *Human Relations*, 1953, 6, 249-272.
- Gerard, H. B. Some effects of status, role clarity, and group goal clarity upon the individual's relations to group process. *Journal of Personality*, 1957, 25, 475-488.
- Gibb, C. A. The principles and traits of leadership. *Journal of Abnormal and Social Psychology*, 1947, 42, 267-284.
- Golembiewski, R. T. *The small group: An analysis of research concepts and operations*. Chicago: The University of Chicago Press, 1962.
- Guetzkow, H., and Simon, H. A. The impact of certain communication nets upon organization and performance in task-oriented groups. *Management Science*, 1955, 1, 233-250.
- Hare, A. P. *Handbook of small group research*. Glencoe, Ill.: The Free Press of Glencoe, 1962.
- Hare, A. P., Borgatta, E. F., and Bales R. F. (Eds.), *Small groups: Studies in social interaction*. New York: Knopf, 1965.
- Hemphill, D. H. The structure of interaction at school board meetings. Unpublished doctoral dissertation, University of Alberta, 1968.
- Heslin, R., and Dunphy, D. Three dimensions of member satisfaction in small groups. *Human Relations*, 1964, 17, 99-112.





- Hoffman, P. J. The paramorphic representation of clinical judgement. *Psychological Bulletin*, 1960, 57, 116-131.
- Hollander, E. P. *Leaders, groups, and influence*. New York: Oxford University Press, 1964.
- Homans, G. C. *The human group*. New York: Harcourt, Brace and World, 1950.
- Homans, G. C. Social behavior as exchange. *American Journal of Sociology*, 1958, 63, 597-606.
- Hurwitz, J. I., Zander, A. F., and Hymovitch, B. Some effects of power on the relations among group members. In D. Cartwright and A. Zander (Eds.), *Group dynamics: Research and theory*. Evanston, Ill.: Row, Peterson, 1953.
- Jackson, J. M. The organization and its communication problems. *Journal of Communication*, 1959, 9, 158-167.
- Katz, D., and Kahn, R. L. *The social psychology of organizations*. New York: Wiley, 1966.
- Kelley, H. H. Communication in experimentally created hierarchies. *Human Relations*, 1951, 4, 39-56.
- Lana, R. E., Vaughan, W., and McGinnies, E. Leadership and friendship status as factors in discussion group interaction. *Journal of Social Psychology*, 1960, 52, 127-134.
- Leavitt, H. J. Some effects of certain communication patterns on group performance. *Journal of Abnormal and Social Psychology*, 1951, 46, 38-50.
- Lewin, K. Group decision and social change. In G. E. Swanson, T. M. Newcomb, and E. L. Hartley (Eds.), *Readings in social psychology* (Rev. ed.). New York: Holt, 1952.
- Likert, R. *New patterns of management*. New York: McGraw-Hill, 1961.
- Linn, R. L. A Monte Carlo approach to the number of factors problem. *Psychometrika*, 1968, 33, 37-71.
- Lippitt, R., Polansky, N., Redl, F., and Rosen, S. The dynamics of power. *Human Relations*, 1952, 5, 37-64.
- Litterer, J. A. *The analysis of organizations*. New York: John Wiley, 1965.



- Maier, N. R. F. *Problem-solving discussions and conferences*. New York: McGraw-Hill, 1963.
- McGrath, J. E., and Altman, I. *Small group research*. New York: Holt, Rinehart and Winston, 1966.
- Mills, T. M. *The sociology of small groups*. Englewood Cliffs, N.J.: 1967.
- Miyamoto, S. F., Crowell, L., and Katcher, A. Communication behavior in small discussion groups. *Journal of Communication*, 1957, 7, 151-160.
- Mulder, M. The power variable in communication experiments. *Human Relations*, 1960, 13, 241-257.
- Mussen, P. H., and Porter, L. W. Personal motivation and self-conceptions associated with effectiveness and ineffectiveness in emergent groups. *Journal of Abnormal and Social Psychology*, 1959, 59, 23-27.
- Olmsted, M. S. *The small group*. New York: Holt, Rinehart, and Winston, 1961.
- Radke, M., and Klisurich, D. Experiments in changing food habits. *Journal of the American Dietetic Association*, 1947, 23, 403-409.
- Schachter, S. Deviation, rejection, and communication. *Journal of Abnormal and Social Psychology*, 1951, 46, 190-207.
- Shaw, M. E. Some effects of problem complexity upon problem solution efficiency in different communication nets. *Journal of Experimental Psychology*, 1954, 48, 211-217.
- Shaw, M. E., and Gilchrist, J. C. Intra-group communication and leadership choice. *Journal of Social Psychology*, 1956, 43, 133-138.
- Shepherd, C. R. *Small groups: Some sociological perspectives*. San Francisco: Chandler, 1964.
- Sherif, M., and Sherif, C. W. *An outline of social psychology*. (Rev. ed.). New York: Harper, 1956.
- Siegel, S. *Non-parametric statistics for the behavioral sciences*. New York: McGraw-Hill, 1956.
- Sprott, W. J. H. *Human groups*. Harmondsworth, Eng.: Penguin Books, 1958.



- Swanson, G. E. The effectiveness of decision-making groups. *Adult Leadership*, 1959, 8, 48-52.
- Thibaut, J. W., and Kelley, H. H. *The social psychology of groups*. New York: Wiley, 1959.
- Torrance, E. P. Some consequences of power differences on decision-making in permanent and temporary three-man groups. In A. P. Hare, E. F. Borgatta, and R. F. Bales (Eds.), *Small groups*. New York: Knopf, 1955.



## A P P E N D I X     A

### PROCEDURAL RULES





INSTRUCTIONS TO CHAIRMEN - CONDITION A

You are a school principal. This group, of which you are chairman, is the school's "executive committee." The executive committee of your school meets every second week to discuss problems relating to the administration of the whole school. The other members of the group are your assistant principals and department heads. The matters discussed during meetings of the "executive" are considered confidential.

You have read and analyzed the problem with which you are faced at the present time. Circumstances make it necessary that a definite decision be taken today concerning the course of action to be followed in an attempt to resolve the problem presented in the case. A decision must be reached before the meeting is adjourned.

It has been your policy to reserve the right to make the final decision on important matters which affect your school. You have explained to the "executive" and to the staff as a whole that since you are held responsible for whatever decisions are made you can hardly place yourself in the position of being responsible for a decision made by others. You have presented this problem to the "executive" because you felt that the ideas of other staff members might help you to make a better decision. You, however, will make the final decision.

You are to announce your decision to the group as soon as you are personally convinced as to the best course of action to be taken. Your decision will be final.

REMEMBER: THE RESPONSIBILITY FOR MAKING THE DECISION LIES WITH YOU ALONE. YOU SHOULD ANNOUNCE THE DECISION FOR YOUR GROUP AS SOON AS YOU ARE CONVINCED OF THE BEST COURSE OF ACTION TO BE FOLLOWED. THE DECISION OF YOUR GROUP WILL BE COMPARED WITH DECISIONS MADE BY OTHER GROUPS FACED WITH THE SAME PROBLEM.



INSTRUCTIONS TO CHAIRMEN - CONDITION B

You are a school principal. This group, of which you are chairman, is the school's "executive committee." The "executive committee" of your school meets every second week to discuss problems relating to the administration of the whole school. The other members of the group are your assistant principals and department heads. The matters discussed during meetings of the "executive" are considered confidential.

You have read and analyzed the problem with which you are faced at the present time. Circumstances make it necessary that a definite decision be taken today concerning the course of action to be followed in an attempt to resolve the problem presented in the case. A decision must be reached before the meeting is adjourned.

From the beginning these "executive" meetings have operated on the principle of majority rule, with the provision that you, like each of the others, must vote on the final decisions concerning matters brought before the committee. All members of the committee have agreed to accept responsibility for any final decision to which a majority of at least three agrees. You have no veto power.

You or any other member of the committee may call for a vote on a final decision at any time. When you or some other member wishes a vote to be taken it is your responsibility as chairman to suspend discussion temporarily and to put the question to the group immediately. Every member, including yourself, must indicate his opinion on the question by raising his hand when a vote is taken. When at least three members agree on a course of action you should announce the decision of the group and adjourn the meeting.

REMEMBER: WHEN A MAJORITY OF AT LEAST THREE AGREES ON A COURSE OF ACTION THE DECISION IS BINDING ON THE GROUP. THE DECISION OF YOUR GROUP WILL BE COMPARED WITH DECISIONS MADE BY OTHER GROUPS FACED WITH THE SAME PROBLEM.



INSTRUCTIONS TO CHAIRMEN - CONDITION C

You are a school principal. This group, of which you are chairman, is the school's "executive committee." The "executive committee" of your school meets every second week to discuss problems relating to the administration of the whole school. The other members of the group are your assistant principals and department heads. The matters discussed during meetings of the "executive" are considered confidential.

You have read and analyzed the problem with which you are faced at the present time. Circumstances make it necessary that a definite decision be taken today concerning the course of action to be followed. A decision must be reached before the meeting is adjourned.

From the beginning these "executive" meetings have operated on the principle that no final decision is binding until everyone agrees to it, with the provision that you, like each of the others, must vote on every question brought before the committee. Individual members felt that they could not accept responsibility for decisions of the committee unless support for the decisions was unanimous.

You or any other member of the committee may call for a vote on a final decision at any time. When you or some other member wishes a vote to be taken on a final decision it is your responsibility as chairman to suspend discussion temporarily and to put the question to the group immediately. Every member, including yourself, must indicate his opinion on the question by raising his hand when a vote is taken. When all members agree to a course of action you should announce the decision of the group and adjourn the meeting.

REMEMBER: NO DECISION IS BINDING ON THE GROUP UNTIL ALL FIVE MEMBERS AGREE ON THE COURSE OF ACTION TO BE FOLLOWED. THEY MUST INDICATE THEIR AGREEMENT BY A SHOW OF HANDS. THE DECISION OF YOUR GROUP WILL BE COMPARED WITH DECISIONS MADE BY OTHER GROUPS FACED WITH THE SAME PROBLEM.





INSTRUCTIONS TO GROUP MEMBERS - CONDITION A

This group is the "executive committee" of your school. It is composed of the principal and his assistant principals and department heads. You are either an assistant principal or a department head. The chairman of this group is the principal of your school. This "executive committee" meets every second week to discuss problems relating to the administration of the whole school. The matters discussed during these meetings are considered confidential.

You have read and analyzed the problem with which you are faced at the present time. Circumstances make it necessary that a definite decision be taken today concerning the course of action to be followed. A decision must be reached before the meeting is adjourned.

It has been the principal's policy to reserve the right to make the final decision on important matters which affect the school. He has explained to the "executive" and the staff as a whole that since he is held responsible for whatever decisions are made, he could hardly put himself in the position of being responsible for a decision made by others. He has presented the problem outlined in the case to the group because he felt that the ideas of other staff members might help him to make a better decision. He will, however, make the final decision himself. He will announce his decision to the group as soon as he is personally convinced as to the best action to be taken. His decision will be final.

REMEMBER: THE RESPONSIBILITY FOR MAKING THE DECISION LIES WITH THE PRINCIPAL (CHAIRMAN) ALONE. HE WILL ANNOUNCE THE DECISION FOR THE GROUP AS SOON AS HE IS CONVINCED OF THE BEST COURSE OF ACTION TO BE FOLLOWED. THE DECISION OF YOUR GROUP WILL BE COMPARED WITH DECISIONS MADE BY OTHER GROUPS FACED WITH THE SAME PROBLEM.



INSTRUCTIONS TO GROUP MEMBERS - CONDITION B

This group is the "executive committee" of your school. It is composed of the principal and his assistant principals and department heads. You are either an assistant principal or a department head. The chairman of this group is the principal of your school. This "executive committee" meets every second week to discuss problems relating to the administration of the whole school. The matters discussed during these meetings are considered confidential.

You have read and analyzed the problem with which you are faced at the present time. Circumstances make it necessary that a definite decision be taken today concerning the course of action to be followed. A decision must be reached before the meeting is adjourned.

From the beginning these "executive" meetings have operated on the principle of majority rule, with the provision that the principal (chairman), like each of the others, must vote on the final decisions concerning matters brought before the committee. All members of the committee have agreed to accept responsibility for any final decision to which a majority of at least three agrees. The principal has no veto power.

The chairman, or any other member of the committee, may call for a vote concerning a final decision at any time. When such a vote is called it is the chairman's responsibility to suspend discussion temporarily and to put the question to the group immediately. Every member, including the chairman, must indicate his opinion on the question by raising his hand when a vote is taken. When at least three members agree on a course of action the chairman will announce the decision of the group and adjourn the meeting.

REMEMBER: WHEN A MAJORITY OF AT LEAST THREE AGREES ON A FINAL COURSE OF ACTION THE DECISION IS BINDING ON THE GROUP. THE DECISION OF YOUR GROUP WILL BE COMPARED WITH DECISIONS MADE BY OTHER GROUPS FACED WITH THE SAME PROBLEM.



INSTRUCTIONS TO GROUP MEMBERS - CONDITION C

This group is the "executive committee" of your school. It is composed of the principal and his assistant principals and department heads. You are either an assistant principal or a department head. The chairman of this group is the principal of your school. This "executive committee" meets every second week to discuss problems relating to the administration of the whole school. The matters discussed during these meetings are considered confidential.

You have read and analyzed the problem with which you are faced at the present time. Circumstances make it necessary that a definite decision be taken today concerning the course of action to be followed. A decision must be reached before the meeting is adjourned.

From the beginning these "executive" meetings have operated on the principle that no final decision is binding until everyone agrees to it, with the provision that the principal (chairman), like each of the others, must vote on every question brought before the committee. Individual members felt that they could not accept responsibility for decisions of the committee unless support for the decisions was unanimous.

The chairman, or any other member of the committee, may call for a vote concerning a final decision at any time. When such a vote is called it is the chairman's responsibility to suspend discussion temporarily and to put the question to the group immediately. Every member, including the chairman, must indicate his opinion on the question by raising his hand when a vote is taken. When all five members of the committee agree on a course of action the chairman will announce the decision of the group and adjourn the meeting.

REMEMBER: NO FINAL DECISION IS BINDING ON THE GROUP UNTIL ALL FIVE MEMBERS AGREE ON THE COURSE OF ACTION TO BE FOLLOWED. THE DECISION OF YOUR GROUP WILL BE COMPARED WITH DECISIONS MADE BY OTHER GROUPS FACED WITH THE SAME PROBLEM.



## A P P E N D I X      B

### ORIGINAL INSTRUMENTS





## THE DECISION

The purpose of this questionnaire is to determine your reactions to the decision reached by your group during the session just completed.

Please respond to every item by circling the number which corresponds to the following key:

- (1) disagree very strongly
- (2) disagree quite strongly
- (3) disagree somewhat
- (4) agree somewhat
- (5) agree quite strongly
- (6) agree very strongly

Example

I was unhappy with the decision reached.                      1    2    3    4    (5)    6

If you have circled number 5, you have indicated that you agree quite strongly with the statement. That is, you were unhappy with the decision.

PLEASE: READ THE KEY AND EACH ITEM VERY CAREFULLY TO ENSURE THAT  
YOUR RESPONSES CORRECTLY REFLECT YOUR INTENT.

Name: \_\_\_\_\_

Date Today: \_\_\_\_\_

Group: \_\_\_\_\_



PLEASE RE-READ THE KEY BEFORE RESPONDING. THE HIGHER THE NUMBER THE STRONGER THE AGREEMENT WITH THE STATEMENT.

- |                             |                          |
|-----------------------------|--------------------------|
| (1) disagree very strongly  | (4) agree somewhat       |
| (2) disagree quite strongly | (5) agree quite strongly |
| (3) disagree somewhat       | (6) agree very strongly  |
- 

- |    |  |   |   |   |   |   |   |
|----|--|---|---|---|---|---|---|
| 1. | It is unlikely that other groups in this experiment reached a decision better than ours.   | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. | If I had an opportunity to examine the problem alone tomorrow I would reach the same decision as that just reached by the group.     | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. | It would have been possible to reach a better decision if we had taken more time.  | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. | The interests of the key individuals in the case presented would be best served by the decision we took.                             | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. | A group of experienced educational leaders would likely have made a decision similar to the one our group made.                      | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. | If a similar problem arose in a school in which I was employed I would not recommend the same kind of solution.                      | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. | The school, as a whole, would be best served by the decision we took.  | 1 | 2 | 3 | 4 | 5 | 6 |
| 8. | It is likely that the group could have reached another decision that would have been better than the one we reached in this session. | 1 | 2 | 3 | 4 | 5 | 6 |



## THE DECISION-MAKING PROCESS

The purpose of this questionnaire is to determine your reactions to the process by which your group reached its decision during the session just completed.

Please respond to every item by circling the number which corresponds to the following key:

- (1) disagree very strongly
- (2) disagree quite strongly
- (3) disagree somewhat
- (4) agree somewhat
- (5) agree quite strongly
- (6) agree very strongly

Example

The members of the group were  
difficult to work with.

1    2    3    4    (5)    6

If you have circled number 5, you have indicated that you agree quite strongly with the statement. That is, you feel quite strongly that the group was difficult to work with.

PLEASE: READ THE KEY AND EACH ITEM VERY CAREFULLY TO ENSURE THAT  
YOUR RESPONSES CORRECTLY REFLECT YOUR INTENT.

Name: \_\_\_\_\_

Date Today: \_\_\_\_\_

Group: \_\_\_\_\_





PLEASE RE-READ THE KEY BEFORE RESPONDING. THE HIGHER THE NUMBER THE STRONGER THE AGREEMENT WITH THE STATEMENT.

- |                             |                          |
|-----------------------------|--------------------------|
| (1) disagree very strongly  | (4) agree somewhat       |
| (2) disagree quite strongly | (5) agree quite strongly |
| (3) disagree somewhat       | (6) agree very strongly  |
- 

- |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| 1. Under the conditions in which the group operated everyone felt free to contribute any idea that he thought might be useful.                        | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. Ideas were given attention and consideration regardless of which individual presented them.  | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. The decision reached was not acceptable to all members of the group.   | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. Not every member of the group contributed something worthwhile to the discussion.  | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. The discussion that preceded our decision was not sufficient to examine all the pertinent information provided in the written outline of the case. | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. I felt ill-at-ease during the discussion.  | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. Individual members of the group showed a willingness to compromise in an attempt to find a solution that was acceptable to all.                    | 1 | 2 | 3 | 4 | 5 | 6 |
| 8. A good number of possible solutions were discussed before the final decision was made.   | 1 | 2 | 3 | 4 | 5 | 6 |
| 9. When group members disagreed with a suggestion they criticized the idea rather than the person.  | 1 | 2 | 3 | 4 | 5 | 6 |



PLEASE RE-READ THE KEY BEFORE RESPONDING. THE HIGHER THE NUMBER  
THE STRONGER THE AGREEMENT WITH THE STATEMENT.

- |                             |                          |
|-----------------------------|--------------------------|
| (1) disagree very strongly  | (4) agree somewhat       |
| (2) disagree quite strongly | (5) agree quite strongly |
| (3) disagree somewhat       | (6) agree very strongly  |
- 

- |     |  |   |   |   |   |   |   |
|-----|--|---|---|---|---|---|---|
| 10. | No person in the group took more than his share of discussion time.                                      | 1 | 2 | 3 | 4 | 5 | 6 |
| 11. | Our group did not take the problem seriously and did not make a sincere effort to reach a good decision. | 1 | 2 | 3 | 4 | 5 | 6 |
| 12. | There was order and direction as the group attempted to find a solution to the problem.                  | 1 | 2 | 3 | 4 | 5 | 6 |
| 13. | Most of the discussion time was spent on matters relevant to the problem at hand.                        | 1 | 2 | 3 | 4 | 5 | 6 |
| 14. | The decision was taken before everyone's view had been heard and discussed.                              | 1 | 2 | 3 | 4 | 5 | 6 |
| 15. | I was not satisfied with the total process by which the decision was made.                               | 1 | 2 | 3 | 4 | 5 | 6 |



A P P E N D I X C

FINAL INSTRUMENT ITEMS



## DECISION INSTRUMENT--FINAL ITEMS

1. It is unlikely that other groups in this experiment reached a decision better than ours.
2. If I had an opportunity to examine the problem alone tomorrow I would reach the same decision as that just reached by the group.
4. The interests of the key individuals in the case presented would be best served by the decision we took.
5. A group of experienced educational leaders would likely have made a decision similar to the one our group made.
6. If a similar problem arose in a school in which I was employed I would not recommend the same kind of solution.
7. The school, as a whole, would be best served by the decision we took.
8. It is likely that the group could have reached another decision that would have been better than the one we reached in this session.





## PROCESS INSTRUMENT--FINAL SUB-SCALE ITEMS

## "Performance Facilitation" Sub-scale

1. Under the conditions in which the group operated everyone felt free to contribute any idea that he thought might be useful.
2. Ideas were given attention and consideration regardless of which individual presented them.
4. Not every member of the group contributed something worthwhile to the discussion.
10. No person in the group took more than his share of discussion time.
11. Our group did not take the problem seriously and did not make a sincere effort to reach a good decision.
12. There was order and direction as the group attempted to find a solution to the problem.
13. Most of the discussion time was spent on matters relevant to the problem at hand.

## "Task Achievement" Sub-scale

3. The decision reached was not acceptable to all members of the group.
7. Individual members of the group showed a willingness to compromise in an attempt to find a solution that was acceptable to all.
15. I was not satisfied with the total process by which the decision was made.

## "Discussion Adequacy" Sub-scale

5. The discussion that preceded our decision was not sufficient to examine all the pertinent information provided in the written outline of the case.



8. A good number of possible solutions were discussed before the final decision was made.
14. The decision was taken before everyone's view had been heard and discussed.



## A P P E N D I X     D

### DISCUSSION   PROBLEMS





## FIVE CREDITS IN MUSIC\*

"You know those two boys you asked me to talk to? Well, I did, and I think this is more of an administrative problem than a guidance one. You got a minute?"

"I think so," replied Dan Bennett, the principal at Trudeau Technical High. "Those girls can wait another minute or two, I guess. They've been truant for five days now; another ten minutes won't hurt them. What's the story?"

Malcolm ("Mac") Woodbury, math teacher half-time and guidance counselor for the technical boys in the other half, lowered his big frame into a chair by Bennett's desk. "You remember those kids wanted to be transferred from Boys' Chorus into some other class. Well, they had a reason for it."

"Apparently that's a hell-raising class they've got there, and these kids don't want any part of it. They're afraid that the teacher's going to flunk the whole class -- said she threatened to, or some such thing -- and since they're seniors and don't have any extra credits, that would mean they wouldn't graduate.

"I told them they didn't have to worry about it -- that they must have misunderstood her, or else she was just mad and spoke before she thought. But they're still worried, and I think I would be too if I were in their shoes."

"They want to switch classes, but there's not a heck of a lot they can take. The only electives open for them are economics, arts and crafts, and art. One of them wants to take art and the other wants the general music appreciation class, but neither of them really cares anything about those courses except as the least of the possible evils. For that matter, they aren't exactly wild about Boys' Chorus, but it seemed like the safest way to get the credits they need to graduate, so why not?"

"Now, I've known these boys since they came here three years ago, and they're both O.K. Neither of them's going to set the world on fire, but they mind their own business and keep their noses clean. I don't think they have anything to do with the ruckus that seems to be going on in the class. After all, it's about all you could expect there, anyhow.

---

\*Adapted from: Sargent, C. G. and Belisle, E. L. Educational Administration: Cases and Concepts. Boston: Houghton Mifflin, 1955. Reproduced with the permission of Harvard College.



The class is sort of a dumping ground so half of the kids who are in there don't give a darn about what they're doing, and some of them go a lot further than that. There are troublemakers in that crowd. That Sanborn kid is in there, for instance, and he's got some of his buddies with him."

"I'll tell you what," Bennett broke in, "I could go in that class and yank out three or four right now, and that would end the trouble. And just let me look at the bunch there once and I'd know which three or four to yank, too. When you've been around here for a few years, you learn fast who the troublemakers are."

Yeah, that's true," said Mac. "I think I could put my finger on the kids who are causing trouble, too. The only thing is, if you yanked them where would you put them? They've got to go somewhere don't they?"

"Throw them out," replied Bennett. "If they won't behave themselves, suspend them a while and make their parents come with them before letting them back in. Make them know that they've got to behave themselves, that they've got to respect the rights of the others around here if they're going to stay. After all, the kids in this school are here because they chose Tech. We don't require them to be here."

"Yeah, I suppose so," said Mac. "Still, we've tried that before, and we've still got the problem on our hands. Another way to get at it might be to transfer the kids who were squawking about the class. That's what they're asking for, anyhow. Or something might be done about the class as a whole. Sooner or later that will probably have to be done anyhow. You know, that's the class with a new teacher. It's kind of tough on her to give a new teacher a class like that. And she's not really the one for such a class anyhow, aside from her lack of experience. Since something's going to have to be done with that class sooner or later in any event, I think it's really more of an administrative problem than a guidance one. I can transfer those two kids O.K., but that won't take care of the problem of the class itself. You're going to have to do something about that."

"Before you do anything about switching classes for those boys," said Bennett, "let me talk to the teacher. You and I can get together later and decide what to do about it."

Woodbury heaved himself out of the chair and headed for his classroom to catch up on his paper work. Bennett summoned the two waiting girls from the outer office, and the day resumed its normal routine.

Later in the day, Bennett took advantage of a lull to visit Mrs. Bondsens, the teacher of the boys' chorus class. On the way to her room





he reviewed what little he knew about her. He remembered that after working as an elementary music supervisor in a nearby system she had come to Trudeau Tech this year to teach part-time. Before that, he remembered, she had taught in a small college somewhere in the East. He wondered whether her husband was living and whether she needed the job or was just interested in keeping occupied. One thing was sure; the school surely needed her. They had one full-time music teacher, and they didn't quite need another such. And part-time music teachers were hard to find -- at least those with any experience in the public schools. It would be different if there were a symphony orchestra around; symphony musicians very often would take a part-time job like this -- but there just weren't any in this town. They couldn't afford to lose Mrs. Bondsens.

He found her in her room, correcting papers. "My work keeps me in the office so much that I just don't get around to visiting the teachers as I should. I'm the principal, Dan Bennett. Just stopped in to ask how you're doing. I'm afraid we've given you quite a row to hoe in Boys' Chorus."

"Oh, I have no complaints, really." The reply came in a quiet, well-modulated voice. "I do find that trying to fill Mr. Logan's shoes is a bit difficult at times, but I'm sure it's just a matter of not relaxing my efforts to reach the children. It will work out, with time and effort."

"You have the boys' chorus and the recreational music classes, don't you?" asked Bennett.

"Yes," she replied. "I'm here only on a part-time basis to take some of the load from Mr. Logan. I teach only those two classes. They're something of a problem, too. I think the title 'recreational music' is a bit of a mistake and helps to account for it. The children come in expecting to be entertained, you see, not to learn anything. The connotation there is all wrong. I can see why they changed it from 'music appreciation', since that normally means all manner of dullness, but there must be some other more suitable title.

"I think I have the problem solved in that class. At first I was way over their heads, so naturally they were bored. Since then I have come down to their level, and it's incredibly low. I have to remember, too, that I must reach listeners, not performers. I'm teaching children with no talent, drive, or training, and that makes it a much harder job. I'm trying to start where they are. They ask to hear popular music, so I play some records, and let them bring some to be played -- all the while trying to keep them from the more dreadful things, of course. They ask to study popular music, but I tell them there's no need for that, that there's nothing there that can't be understood on the first hearing -- that it doesn't need and won't even repay studying.



"In the chorus I have some boys -- about ten or twelve out of thirty-five -- who simply don't want to be there. They're boys who needed five more credits in order to graduate and just looked around for a course with no homework. That's music. You'd think, then, that they'd be grateful for music, but they're not. They won't sing at all, and they just wait for the bell to ring so they can get out. I tried appealing to school loyalty, but without success. I told them that the chorus puts on a concert every year, and a good one, and that this group won't let down the tradition. But it just doesn't reach them. They don't care.

"I've hit on a plan which might help. The next time they meet I'm going to have them elect a president, vice president, secretary-treasurer, librarian, and assistant librarian. The president will then have the job of calling the group to order and keeping discipline, the vice president will act in his absence, and the secretary-treasurer will take the roll. The librarian and the assistant librarian will see to getting out the music and getting it back. It may help to give them some responsibility.

"Mr. Logan had the same problem when he got here three or four years ago. He simply kept at it, though, and won them over by sheer force of personality. He's talented himself, and children come to recognize and respect talent after a while. As I say, he did it by sheer personality. Then the children come into the class and expect the wonderful Mr. Logan, of whom they've heard so much, and he's not there. Worse yet, it's a woman who is there. I have a sizable handicap to overcome right from the start, you see.

"Now, I suppose the administration might reasonably be concerned, but I don't want to start right off by going to you people. I don't think a new teacher should presume to question until she's had time to look around and gain some perspective. And I hope I will be able to handle my problem myself. At least, I'm going to try.

"I've never encountered such a situation before. I've taught in a teachers' college in New Brunswick and I was music supervisor in one of the neighboring towns before coming here. But I've never run into anything remotely like this! I'm afraid I'm something of a failure, although I can't give up trying. I must confess, though, I'm really disturbed about the situation."

"Well," said Bennett, "I wouldn't be disturbed about this if I were you. Having trouble with that class is not being a failure, by any means. You just keep your head above water and keep trying. I'm sure you'll make out fine. And if you do have any more trouble, don't hesitate to ask for help. If any kid gets out of hand, send him to me -- I'll straighten him out. Meanwhile, keep up the good work. I'm sure you're doing a good job and will be doing an even better one before long."





"As a matter of fact," Bennett was telling Mac Woodbury later, "I think she probably is doing a good job. At least she talks a good fight, and she seems to know pretty well what she's up against. It really was kind of a dirty trick unloading those two classes on her right off the bat. I can understand Logan's wanting to get rid of them, but it doesn't seem right to fire them both to her, especially when they're the only classes she's got. Those are the two classes that boys who need five more credits will take, and sometimes counselors will shove them in for that reason alone. Naturally, some of the boys resent that.

"But these two boys I sent on to you are a problem too. They see trouble brewing and so they want to get out. I don't know but that the thing to do is to yank the troublemakers out and give her a chance. At the same time we'll give these other two boys a chance to finish the year without any trouble. It's really a little late [the time was mid-October] to transfer them to other courses now."

"That would be the one way to do it, all right," said Mac. "I was looking over the schedules of these two kids to see what they could transfer to without trouble. It doesn't look hopeful. One of them elected music, which I hadn't remembered, and he has a pretty good voice too, so he could be switched over to the choral group that Logan teaches [an advanced chorus class which attracts those who have been through the beginning classes who elect to go on with chorus singing]. One trouble with that is you might have trouble between Logan and Mrs. Bondsen over all of the good voices being taken away from her class. That's your problem though, not mine. The other one could probably go to an art class that meets at that time. I see on his record that he wanted Typing 10 but -- and again I was wrong -- he's a technical student and so can't take the typing. While we're on the subject, when are you going to do something about that foolishness? You can tackle it, can't you?"

"Not quite," said Dan. "I'd have to get together with the assistant superintendent in charge of the secondary schools and with the superintendent, but it's not a board matter. I don't know why we should, though. I know it would be handy for technical kids to be able to take typing. But there just wouldn't be enough room if we opened the gates like that."

"Well," Mac answered, "you ought to be able to do something about it if there were enough kids who wanted it. After all, we're supposed to help them, not to hinder them. Think about it, will you?"

"But to get back to these kids and their problem. I suggested that they could stay in the class and do their bit to help the teacher straighten out the class. But I'm not dumb enough to expect them to. And as far as bouncing the troublemakers, that's all well and good, but where would they go? Some of them need credits to graduate, you know.



You just can't stick them in a study hall somewhere. And if they were transferred to any class of mine at this late date, I'd want to know why. I think most of the teachers feel as I do, that if it's a case with a legitimate excuse -- been in the hospital or something like that -- good enough. They'll do their best to help bring them up with the rest of the class. But the others -- I dunno! I'd resent it myself. Nobody likes to have his classes made into a wastebasket, a dumping ground for anything that can't be taken care of anywhere else."

"I guess I'll have to do something about this," sighed Dan. "It's such a little thing, just two kids out of 1,600. But if teachers come into it, I guess it's no longer so little. We could let it ride, but if we do we might lose our part-time music teacher, and you remember as well as I what a tough time we had finding her. It wasn't till after school started that we did find her. If we just transfer the two out of the class, we might still lose Mrs. Bondsens, since that wouldn't help her problem at all -- gets rid of two of her better pupils, in fact. If we boot the troublemakers, then we've got to figure out what to do with them, assuming we have to do anything more for them. They're all old enough to quit school if they want to. I know it's a little matter, but if we start losing teachers it stops being such a little matter. I think this is a matter for the "executive."





## FRITZ KLOSTER\*

New plastic-topped desks had been placed in Room 202, and the students had been asked by the English teacher assigned to the room to make every effort to keep them unmarred. On the third day after the desks had been placed in the room, the teacher noted that a large swastika had been carved through the thick plastic top of one desk -- evidently with a sharp instrument. The teacher noted the names of the six pupils who sat in this seat and reported the matter to the principal. A large pocket knife was found opened within the desk and also presented to the principal.

Principal Walters knew the owner of the knife upon seeing it. The knife had reached the office following a previous wrongdoing. When the teacher reported that Fritz Kloster was one of the six pupils sitting in this seat, it confirmed his belief that Fritz must be responsible.

During the interview which followed, Fritz readily admitted that it was his knife and asked, "Where did ya find it?" However, he vigorously denied that he knew anything about the desk carving.

Only a week later, a boy reported to the football coach that \$4.75 had been taken from his wallet during football practice. The coach, who drives the players home in a school bus, was shocked when he heard the following conversation taking place between Fritz and another boy as they rode homeward:

"Where did you get that hatchet, Fritz?"

"Bought it down at Higgins Hardware."

"How much?"

"Four seventy-five."

The coach explained that Fritz frequently dressed quickly in order to run downtown for a few minutes before the other boys were ready to board the bus. He evidently had purchased the hatchet at this time.

### Interpretation of Test Record

Standardized tests show that Fritz always ranks from one to two school years above average. His I.Q. has been recorded at 113.

---

\*Adapted from: Daniel E. Griffiths, Human Relations in School Administration. New York: Appleton-Century Crofts, 1956. Copyright (c), 1966, Meridith Corporation. Reproduced by permission of Appleton-Century-Crofts.





### Achievement in Tool Subjects

Teacher reports indicate that he has been average or above average at each grade level with the usual added comment that he is a good reader. He has failed only one course -- English -- and that was because of a complete lack of interest in grade eight.

### Mental Ability and Effort

All teachers reported him above average in ability. Effort was average or fair. Several commented that he was very careless and had to be continually reminded in order to get work done. He does excellent work in subjects that he feels he needs. However, if he feels that the subjects are "just a waste of time," he lies down on the job and only does enough work to pass.

### Interests

Fritz had an early interest in farming which has now disappeared. Beyond an expected interest in hunting and athletics, he is most attracted to mechanics and reading. He has become one of the school's most proficient library users and reads most types of books, including some of the most difficult novels found in the library.

### Family Data

Fritz's mother died at about the time he entered school and his father remarried. He disliked his stepmother from earliest comments, and felt that she took his father away from him. He has a sister who is seven years older. They are quite close to each other. The sister was never a problem in school or at home, but shared Fritz's dislike for the stepmother. Upon graduation from high school, she left home to work elsewhere and apparently seldom returns.

Principal Walters characterizes both Mr. and Mrs. Kloster as "wonderful, hard-working people." He adds that Mr. Kloster is rather easygoing by nature and not much of a disciplinarian. Mrs. Kloster never has had any children of her own and found Fritz and his sister to be a little out of hand. Because she enforced good manners and handled the disciplinary matters, the children did not like her.

As time passed and the father backed the stepmother in her decisions, Fritz lost his respect for his father, also. Now he says, "We fight all the time and can't get along together."

### Vocational Choice

Fritz is determined that he will attend the Northern Alberta Institute of Technology with which he has already communicated, and



study automotives. He seems very set in his choice and takes a "don't-care" attitude toward any subjects or phases of subjects which he feels will not directly help him fulfilling this purpose.

### Social Conduct

If ever a boy walked with the proverbial chip on his shoulder, it is Fritz. He takes a rather arrogant attitude toward the world in general and his school life in particular. He has a rather cold shell about him which is difficult to pierce, particularly if the conversation is centered upon his misconduct.

His classmates are never genuinely friendly with him. He invariably stands by himself. At times he becomes very generous with his friendship and forces himself upon would-be-friends. Frequently this is all forgotten within a space of hours, and the old relationship between Fritz and society holds sway.

As a pupil, Fritz is loud and rude. He is one of those pupils who is constantly being summoned to the principal's office regarding one matter or another. His second-grade teacher wrote in his guidance folder: "Belligerent -- egotistical -- any wrong doing on his part is always unintentional -- rationalizes for his own benefit -- unpopular -- talks incessantly -- cannot take criticism." Other grade teachers have only re-echoed these notes with the passing of time.

During the sixth grade, Fritz twice ran away from home. The first time he was accompanied by another boy, but was soon found and returned home. Somewhat later he again disappeared. Police, neighbors, and school officials searched for several days without finding him. Finally he was discovered in an old barn. The boy who had previously accompanied him had been carrying food to him nights.

Both of his parents felt that they had gone as far as they could with Fritz. They sent him to a private school for boys in a neighboring province where he remained for a year and one half. He did better than average work and proved to be no problem. At the end of this period, his father decided to send him to public school both because his help was needed on the farm and because of the prohibitive cost of sending him to the private school.

Since his return, Fritz appears to have picked up where he left off. He caused a good deal of trouble in grades eight and nine, but his final grades were quite good. The only mark he had below a "B" in grade nine was in English where he got a "C". He enrolled in the technical pattern in grade ten. In grade ten he got an "H" in Automotives 12, but failed both English and Social Studies. This year in grade eleven he is repeating Social Studies 10, and English 10.





Counseling

In interviews with the guidance counselor, Fritz refuses to go beyond perfunctory remarks until assured that what he says will be "kept private," as he says. He then speaks very strongly against the manner in which his parents treat him. He also speaks strongly against the required subjects that the school offers.

Interviews reveal that Fritz feels perfectly justified in acting as he does in school and can see no reason for changing his attitude or his conduct.

One of the teachers summed the problem up by saying, "Fritz has a good head on his shoulders and knows how to use it. The pity of it is that he doesn't think that anyone in this school is smart enough to teach him anything. When he goes to technical school or gets a job, he's going to realize how much he has missed that he could have learned right here in high school."

Mr. Walters feels that the problem goes even further. Not only does he feel that Fritz is missing out on school, but he feels that the boy will be a definite problem for society once he leaves school unless something constructive is done. The principal has presented the problem to the "executive". Is there help for a boy like Fritz?



## MR. HOKE

Woodland Junior High School is located in a relatively new residential district of an urban area with a population of approximately half a million. On a beautiful April day, John Franz, the principal, was allowing himself the luxury just before lunch of leaning back in his chair and reviewing the year to date. All was going well, he thought. His staff was working very effectively and harmoniously. He had had several serious discussions with various staff members about problems which had arisen during the year, but in each case the problem was either solved or markedly improved. The only possible exception was the situation building up around Mr. Hoke, the boys' physical education instructor.

This was Bob Hoke's first year in the school and his third year in the system. He was a husky, good-looking young man who had been something of a football hero at University. He was doing an acceptable, though far from outstanding job. Modesty could not be considered one of his virtues, and he was not at all reticent about discussing his exploits on the gridiron . . . especially with the boys in his P.E. classes.

Mr. Franz had heard during the first three months some disturbing, albeit vague, comments among the students about the way Mr. Hoke kidded with the girls. In December four ninth grade girls had come to the office to talk with him about the way Mr. Hoke looked at them and some of the other girls.

"What do you mean, 'the way he looks at us'?" he had asked the girls.

They had looked at each other, shrugged their shoulders and said, "Oh, you know . . . Oh, we don't know how to explain it . . . he makes us embarrassed and . . . oh, I don't know, he just looks at us . . . sort of up and down. You know."

Franz had called Bob in and talked with him about the girls' concern. He also talked with him about the comments he had heard around the school among both the boys and girls.

"But hell," Hoke had said, "Sure I kid with the students. All the teachers do. I don't see anything wrong with that. Hell, you know me better than to think it was anything more than kidding. You know me better than that."

"Now, let's get something straight, Bob," Franz had answered, "We're not discussing what I think of you. We're talking about how the kids in this school are reacting to things you are saying and doing."





And by God that's another matter entirely, and it can't be taken lightly."

He paused for a moment and then continued very quietly, "The implications of what those kids are saying are sinister, and it's your responsibility to see to it that there is no more reason for that kind of talk among them."

"Maybe if I could talk with some of the kids I could. . . ."

"Hell, no, you're not going to talk with any of the kids. That would be one sure way to get them to talking about this thing even more than they are now."

"Well, what can I do if I can't even know who it is that's doing all the yakking?"

"Bob, it's not who is talking that is important. The important question is why they're talking. This is what you have got to figure out and do something about."

In January Franz received word that one of his teachers would be replaced. The replacement turned out to be an attractive young lady named Nancy Belton, who had just arrived in the city. Her husband was to do a year of specialized interning at the medical school in the city, and Nancy wanted a teaching job for the year. She was neat, well-dressed, intelligent and articulate. Although Franz sensed an air of artificiality, he attributed it, in part at least, to the interview situation.

During February a ninth grade girl had come in to see the principal. She was a quiet girl and an exceptionally fine student. Franz was also aware of the fact that she had been a steady baby sitter for the Hokes.

She was quite ill at ease and Mr. Franz said, "Well, Sarah, what can I do for you?"

She rubbed her hands nervously on her dress several times and then began to speak. She spoke so quietly that the principal had to ask her to speak up so that he could hear what it was she was saying.

"I probably shouldn't even have come to you, but I know you know Mr. and Mrs. Hoke and I . . . Well, I. . . ."

"Sarah, I'll be glad to help you if I can. Just tell me what the problem is."

"Well, you know that I babysit for them quite often?"

"Yes, I know that."



"I don't want to hurt either one of them, but I don't want to babysit for them anymore."

She paused and Franz waited patiently for her to continue.

"I feel so uncomfortable riding home with him when I've finished baby sitting at their place."

"Riding home with whom, Mr. Hoke?"

"Yes, I don't know why, and I wish I didn't feel that way about him. But I do and I don't want to go there anymore."

Franz wanted very much to ask her some very specific questions but decided against it. He had heard so much talk about Bob Hoke, but no one had given any specific reasons. What was the man doing to bring about these very serious reactions from so many different students?

"Well, Sarah, this is really not a school problem. Whether you do or do not baby sit for the Hokes again is something you and your parents will have to decide. Feeling the way you do, however, it would seem to be best not to go there anymore."

After discussing it a little further, Sarah left the office. Franz decided not to talk with Bob about his conversation with Sarah. Instead, he wrote up the essence of the conversation and placed it in a folder. He wrote across the top of the folder, "Bob Hoke, Anecdotes" and placed it in the back of his file cabinet.

A few weeks after his talk with Sarah, Franz was working in his office later than usual and Smith, the music teacher, came into his office. The teacher said there was something that had been bothering him for some time and he wondered if he could talk about it. Franz told him to go ahead and talk. The teacher said he felt something should be done about the talk that was going around the school about Nancy Belton and Bob Hoke. He indicated that the students were making a big thing of it, and that some of the teachers, including himself, were becoming quite concerned.

"Today, for instance, one of the kids in my boys' chorus . . . and he's not a wise guy, a little seventh grader . . . came up to me and asked, 'Isn't Mr. Hoke and Mrs. Belton married?' Some of the older kids guffawed, but this kid was honestly concerned. I really think Bob and Nancy should know what the kids are saying."

Franz thanked him for bringing the matter to his attention and assured him that it would be taken care of. After Smith left, the principal of the Woodland Junior High School had sat alone in his office for a long time. He thought about Bob Hoke, he thought about Hoke's wife and





kids, and he thought about himself. It was dark when he finally left the office.

During the next few weeks Franz had been acutely aware of the constant association between Hoke and Mrs. Belton. He saw them standing very close together talking in the halls before and after school. Before and after faculty meetings they were always together. They ate lunch together and spent the lunch hour together. On several occasions he saw them leave school together. He never talked with Bob or Nancy about this, but he did keep a written account of all these incidents and filed them in the folder, "Bob Hoke, Anecdotal." "

During March several things had come up, including several phone calls concerning Bob from parents. These calls indicated that the community had become aware of the talk that was circulating about Hoke. Franz had explained to each that there was no evidence of any unprofessional conduct on the part of the teacher. He wrote up all the things which had been reported to him and all the questionable actions he had observed personally. By April he had accumulated a sizable dossier on Bob Hoke. One evening when he mentioned the amount of time it took to write up all the anecdotes, his wife asked if it wouldn't be better to spend the time trying to help Bob change.

"I have tried to help him. I talked with him for over an hour last fall trying to get him to see where his actions were leading. He knows what his responsibilities are in this thing. My God, he's a grown man; I can't lead him around by the hand and tell him what he can or cannot do."

The principal's thoughts on these things were shattered as a ninth grade girl was helped into his office by a couple of her classmates. The girl was red-eyed and very distraught. The principal asked what had happened and the girl said that Mr. Hoke had tried to kiss her. She burst into tears. Mr. Franz excused the other girls and got Becky McDonald calmed down.

"Now tell me what happened, Becky."

"He called me into the P.E. office just when the bell rang for noon. I hadn't changed out of my shorts yet. He said he wanted to show me some extra equipment he had in there. He shut the door and took me into the equipment room."

"Is that when he kissed you?"

"Well, he didn't actually kiss me, but he was going to."

"How do you know that?"





"Well, he stood close to me and tried to take hold of me, but I ran out of the office and down to the girls' dressing room."

"What did you do then? Did he follow you out of the P.E. office?"

"No. I haven't seen him since. I was crying and I told the girls what happened."

"The girls?"

"The girls in our sixth period P.E. class."

Franz felt sick and angry and hurt. "Now Becky, it just might have been that you misunderstood Mr. Hoke's intentions. Why don't you change, go home and not say anything more about this to anyone until I have had a chance to talk with Mr. Hoke."

"Mr. Franz, I don't want to get Mr. Hoke in trouble, but I was so scared and embarrassed. . . ."

"I understand, Becky. You go on home now and I'll take care of it."

He went into the outer office when the girl had left and told the secretary to call Mr. Hoke at the staff room and tell him to come to the office immediately after lunch.

Hoke appeared at the office door just before classes were to resume and asked, "Did you want to see me?"

"What the hell was going on down there in your office before lunch?"

"What do you mean?"

"You know damned well what I mean. Becky McDonald came straight to my office."

"So what about it? I asked her if she wanted to see the new equipment in my office. She came in and looked around and then suddenly turned and ran out. I don't know what got into her, and I . . . that's all there was to it. I just wondered why she took off like that."

"Bob, she told me you tried to kiss her."

Bob Hoke sat down hard in one of the chairs. "Oh, no . . . Oh, good Lord no."



"Let me tell you something, boy. The fat's really in the fire now. This thing is out of our control, and I've got to let the superintendent know all about it now."

"What 'thing' is out of control? What the hell are you talking about?"

"You know what I'm talking about . . . that business we talked about last fall. Becky went down into the dressing room and told all the girls down there. By now it's probably all over the school and half the community."

Bob got up and started to leave the office. "I'm going to see Becky and talk with her. I'll show her how wrong she was."

"You just do that, Bob, but it won't make a dmaned bit of difference. The damage is done."

As he left the office Hoke swung around and spoke directly to Franz. "This thing started from a lot of vicious talk by a bunch of silly girls who would like to imagine all sorts of things between themselves and a football coach. With the help of a nosey staff it has been blown up into something that could ruin my career before it starts. I have never had a chance to defend myself against these accusations. I'll tell you this. If you or the superintendent or anybody else tries to get rid of me and spoil my reputation you are going to have one hell of a fight on your hands. My home-life and my career are at stake here. I'll appeal to the A.T.A., and if that doesn't help I'll go to court to clear my name if necessary." He slammed the door as he left.

Franz had barely recovered himself when his secretary put through a call from the Superintendent.

"John, this is Tom Black. I don't know what your Bob Hoke has done over there, but it has stirred up a real hornets' nest. My phone has been ringing ever since I got back from lunch. The callers are demanding that Bob Hoke be removed from the school, or they say they will keep their girls out of school. One called him a sex-fiend. I've explained to each caller that they should contact you first. You're going to have to do something. This looks explosive. I'll expect a report in the morning."

As Franz hung up the phone his secretary placed a pile of phone slips on his desk and informed him that there was a Mrs. McDonald in the outer office demanding to see him. She had told the secretary that she wanted to transfer her daughter to Crescent Junior High immediately. Mr. Franz asked his secretary to send Mrs. McDonald in and to call an emergency meeting of the school "executive" for four o'clock that afternoon.











**B29933**